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## ELECTRICAL INSTALLATION IN DETROIT RIVER TUNNEL.

The tunnel under the Detroit river, connecting Detroit and Windsor, Ont., and which is being built by the Michigan Central railroad, is to be electrically operated.

The tunnel is comprised of two separate iron tubes laid at a depth of 65 ft. below the surface of the water. The section to be operated by electricity is a trifle over four miles long and with the yards totals 15 miles of single track.

It is thought that electric locomotives for tunnel operation will give not only greater celerity in handling traffic but will also perceptibly lighten the ventilation problem. The equipment of locomotives is to include six 100-ton direct-current locomotives of swivel-truck type, with geared motors, each locomotive capable of hauling a 900-ton load up a two per cent grade at ten miles per hour. The locomotives are each to be mounted with four 280-H. P. motors, two of which are to be placed on each swivel truck. The Sprague-General Electric multiple unit control will be the system installed, the locomotives running either in pairs or singly.

The third-rail system will furnish current, to be taken therefrom by contact shoes. Automatic high-speed air brakes will be installed. The General Electric Co. is to furnish the electric equipment for the locomotives and the tunnel in general as well.

The current required for operating is to be obtained from the Detroit Edison Co. and a substation at Detroit will receive it at a potential of 4,400 volts, at a frequency of 60 cycles. This substation is to be fitted with two 1,000 kilowatt synchronous motor-generator sets, from which the third rail will be supplied at 650 volts. On shaft extensions of each of the motor-generator sets 15-kilowatt 125-volt exciters for

the synchronous motors will be fitted.

The lighting and pumping installations are to be very complete, the yards and approaches to be lighted by arc lamps and the tunnel to be fitted with incandescent lamps installed on duplicate circuits. The lighting circuits will receive alternating current at a frequency of 60 cycles, the circuits being so arranged that if either is broken one-half of the lamps in each tunnel will burn. Running through each tunnel there will be a single three-phase distributing circuit with connection to step-down transformers, the secondaries of the transformers to be interconnected with duplicate circuits for one-half of the lamps in each tunnel.

Induction motor centrifugal pumps arranged in duplicate will be provided to drain each of five sumps, the pump motors operating directly at 4,000 volts. The controlling circuits with compensators will be centralized in the substation. The depths of water in each sump will be indicated by both visible and audible devices at the substation.

A regulation storage battery for carrying the load fluctuation is to be installed in the substation which, should the necessity arise, will be capable of operating the entire system for half an hour. In such an event the lighting and pumping alternating current equipment will be energized by 60-cycle, alternating current from a 50-kilowatt motor-generator set, the driving motor being supplied with current from the storage battery. Flexible switching arrangements will be installed to enable this interchange of power supply to be easily and quickly effected.

## EXCURSION BOAT INSPECTION SERVICE IN NEW YORK.

Every excursion about New York will be inspected at least once a week during the coming summer and every viola-

tion of regulations prescribed for the safety of passengers will be prosecuted by a newly-formed organization which is so constituted that in effect it includes every person who goes upon an excursion. This organization is the People's Institute Marine League, under which title are enrolled the following organizations: The American Association of Masters, Mates and Pilots; Marine Engineers' Beneficial Association; Marine Engine Builders; American Life-saving Society and the People's Institute Organization.

The central committee is the working unit of the institute. All reports will be made to it, and it will prosecute owners of vessels who persist in neglecting to equip their craft with the safety devices required by law, or who attempt to run boats which are not safe or are improperly manned. The membership of the League includes about 40,000 men, among whom are a large number belonging to the crews of the vessels that carry excursion crowds, and by this means the Institute League will be enabled to obtain personal information of the exact condition of every boat employed in the excursion trade about New York. It is quite generally known that many of the boats carrying excursion crowds are not in first-class seaworthy condition.

The volunteer inspectors have been provided with printed blanks which they need only to fill out to give an exact account of the conditions as they prevail on the various boats. The blanks contain various questions relative to the number and character of safety appliances, the character and discipline of crews, etc. The inspectors will test life preservers and ascertain whether the required number are provided and whether they are accessible. Particular attention will be paid to overcrowding of boats and as the league has a list of the number each boat is allowed to carry, it will be easy to discover violations.

Every organization in the city which is even remotely liable to conduct an ex-

cursion, such as churches, lodges, settlements and social organizations has been notified by circular letter of the plan, and also supplied with the inspection blanks. It is to be hoped that by this means if by no other a repetition of the Slocum horror may be avoided.

### INTERNATIONAL MERCANTILE MARINE CO.

Even its remarkably successful operations for 1905, its previous banner year, were surpassed by the International Mercantile Marine Co. in the year ended Dec. 31, 1906.

The interesting feature in connection with the report is the statement that new tonnage to the amount of 127,530 tons has been arranged for, the number of vessels to be built being nine, as follows:

(1) An express mail, passenger and cargo steamer for the North Atlantic trade which, the report states, in point of luxury and size will far surpass anything hitherto attempted.

(2) A passenger and cargo steamer, also for the North Atlantic trade.

(3) A passenger and cargo steamer for the Atlantic Transport Line, New York-London service.

(4 and 5) Two mail passenger and cargo steamers for the Dominion Line, Canadian service.

(6) A large passenger and cargo steamer designed for the London-Australian trade.

(7, 8 and 9) Three steamers for Leyland Line.

It is expected that these vessels, with the possible exception of the large fast steamer and the second steamer for the Canadian trade, will be in commission by the early part of 1909.

The company's income account for the year ended Dec. 31, compared with those for the two previous years, follows:

	1906	1905	1904
Gross voy. earn. ....	\$35,931,412	\$32,435,512	\$27,926,907
Mis. earn. ....	1,256,397	927,406	920,085
Ttl. earn. ....	\$37,187,809	\$33,362,918	\$28,846,992
Gross exp. ....	29,155,187	27,456,174	27,040,585
Net earn. ....	\$ 8,032,631	\$ 5,906,744	\$ 1,806,407
Chgs. & txs. ....	3,695,836	3,880,055	3,845,556
Surplus .....	\$ 4,236,795	\$ 2,026,689	\$ 2,039,149
Sur. ins. ac. ....	791,959	864,159	897,052
Sur. for yr. ....	\$ 5,028,754	\$ 2,890,848	\$ 1,142,097

\*Deficit.

The statement includes the combined income account of the American, Red Star, White Star, Dominion, and Atlantic Transport lines, but does not include the operations of the Leyland and National lines, in which the parent corporation has important holdings. These lines have made separate reports to their shareholders showing profits for the year amounting to £136,-

910 7s 9d for the Leyland line, and £16,-877 1s 11d for the National line.

The International Mercantile Marine Co.'s profit and loss account showed:

Balance of earnings as above.....	\$5,028,754	
Surplus Dec. 31, 1905.....	250,152	
Available surplus .....	\$5,278,906	
Amount appropriated for depreciation on steamships.....	5,000,000	
Profit and loss surplus.....	\$ 278,906	

The condensed general balance sheet, as of December 31 last compares as follows:

	1906	1905.	Decrease.
Assets—			
Cost of properties .....	\$171,997,011	\$171,001,608	*\$995,403
Inv. other cos. ....	13,016,379	12,989,534	*26,845
Cash with t'st's .....	235,602	183,366	*52,236
Inventories .....	789,052	799,374	10,322
Accts. rec. ....	1,763,837	1,593,817	*170,020
Bills rec. ....	429,000	266,850	*162,150
Int. rec. ....	8,455	8,503	48
Adv. & cur. accts. ....	184,981	1,687,737	1,502,756
Agency bals. ....	185,887	169,383	*16,504
Mkbl. stocks & bonds ..	598,609	598,742	133
Cash .....	806,903	1,165,984	359,081
Def'd chgs .....	2,032,078	2,080,774	48,696
Total .....	\$192,047,794	\$192,545,672	\$497,878
Liabilities—			
Pfd. stock .....	\$ 51,730,971	\$ 51,730,971	
Com. stk. ....	49,932,735	49,932,735	
Stk. constituent cos. outstdg. ....	1,697	1,697	
Bds. & debts .....	73,140,580	73,502,533	\$421,953
Loans and mtgs. ....	724,238	726,837	2,599
Lns and bls. pay. ....	768,699	6,326,989	5,558,290
Accts. pay. ....	3,302,971	2,988,457	*314,514
Agency bals. ....	148,131	168,026	19,895
Int. accrd. ....	1,018,811	1,023,194	4,383
Adv. & cur. accts. ....	55,905		*55,905
Reserves .....	548,364	648,908	100,544
Dfd. credits .....	2,222,397	2,046,407	*175,990
Ins. fund .....	1,000,000	1,000,000	
Dep'n fund. ....	7,173,389	2,138,766	*5,034,623
P. & L. surplus .....	278,906	250,152	*28,654
Total .....	\$192,047,794	\$192,545,672	\$497,878

\*Increase.

In his remarks to the shareholders of the International Mercantile Marine Co., J. Bruce Ismay, the president of that corporation, says:

"The steamers of the company's fleet were operated during the year without any serious casualty being sustained, the insurance fund showing a profit of \$791,958. During the year substantial payments on account of floating debt were made from earnings, and the item of loans, etc., was reduced from \$6,326,989 to \$768,698.

"Under the sinking fund provision, \$279,000 of first mortgage bonds were retired, and the holdings of debenture bonds of constituent companies in the hands of the public were reduced from \$921,533 to \$778,579. More than \$5,000,000 has been transferred to depreciation fund, making the total credit of insurance and depreciation over \$8,000,000.

#### SOLD AMERICAN VESSELS.

"All the company's steamers and other property have been maintained in a high state of efficiency. The directors disposed of the American-built steamers Maine and Missouri at a satisfactory price because of the cost of operating

under an American registry. New vessels have been ordered for the various lines of the company, which are expected to be in commission by the early part of 1909. During the year four old steamers were disposed of, as they could no longer be employed to advantage. The number of steamers now in service being 123, with a gross tonnage of 1,015,761 tons.

"In 1906 the total number of passengers carried was 487,934, an increase of 54,706. Out of the 88,056 first class, 146,187 second class, and 445,214 third class passengers, carried between British and North American ports, the International Mercantile Marine steamers carried 46,139 first class, 53,277 second class and 182,350 third class passengers.

"The improvement in freights during the first quarter of 1906 was not maintained during the remainder of the year, the conditions being especially disappointing in the last quarter, due to the congested conditions of the railroads. This is ascribed as the reason for many of the steamers from North Atlantic ports sailing with a large amount of vacant space. The cargo trade to Australia and New Zealand was not as good as anticipated, but conditions have improved and better results are looked for during 1907. The reciprocal agreement with the Hamburg-American and North German Lloyd lines has resulted advantageously to International Mercantile Marine."

At the annual meeting of the company's shareholders yesterday, all the retiring directors were re-elected.

### AMBROSE CHANNEL.

Dredging out of the harbor's bottom a matter of 42,500,000 cubic yards of sand, silt and rock, not unmixed with decayed garbage, is a pretty big job, even for government engineers, so when you ask them how long it will take to complete the improvement of Ambrose channel, they tell you frankly they don't know.

But when you ask about the recent feat of the Standard Oil Company's tankboat Phoebus in ascending this channel they smile in a superior sort of way, and tell you that the Phoebus might have done the same thing fifty years ago, had the vessel been in existence at that time. The Phoebus drew 19 ft., but the tide was high, the day was clear, and although the surveys show a shoal which, when the dredging was begun, was 14½ ft., this could have been avoided, and the water showed ample depth at other points along the route. This shoal disappeared more than a year ago, and fully a year ago Sandy Hook Pilot Beebe took a

freighter drawing 22 ft. through the channel.

Ultimately, Ambrose channel will afford a passage from deep water to the inner harbor, 35 ft. in depth, 2,000 ft. in width, and five miles shorter than the old channel for vessels of deep draught. The depth will be 5 ft. greater than the average for the old channel, allowing for the increasing size of trans-Atlantic steamers, which have been growing rather frequently of late. Ambrose channel will be, in fact, a submerged canal, of width sufficient to accommodate thirty great steamers like the Deutschland lying abreast. Aside from these advantages to navigation, there is still another point which will make the \$5,000,000 or \$6,000,000 involved seem well spent.

The old channel makes a sharp bend at what is called "So'west Spit," amounting to 116 degrees in the mile. That's a pretty sharp turn for an ocean liner, even under most favorable circumstances. Ambrose channel opens up from deep water at a point about half way between Coney Island and Sandy Hook; roughly speaking, about four miles from each. It runs as straight as a ruled line for about four miles, where there is a slight bend to the east, then straight ahead again for another mile and a half, where there is a second bend of no more formidable proportions, which leads into the Narrows, the total distance being about seven miles.

The work was undertaken by private contractors in 1899, but not much progress was made for the first year, the government making a time allowance for the building of dredging steamers. Then the government decided to work with the contractors. Last October the contractors drew off, and the work is now being prosecuted by the government alone, through the engineer corps of the army, Col. William Marshall being in charge. The undertaking has presented no engineering difficulties, except those of magnitude, and the necessity of dumping the material removed in deep water.

Two steamer dredges are now in operation. Each has hold room for a matter of 2,100 cubic yards of sand, and when the vessels are loaded to capacity they steam out to deep water, discharge cargo and return again. Ambrose channel now has a uniform depth of 35 ft., although much remains to be done before the uniform width of 2,000 ft. is attained. Within a few weeks it will be thrown open for the passage of trans-Atlantic liners. The saving in time amounts to from fifteen to twenty minutes—not much to outbound passengers, but a great deal to those coming home, with friends and relatives awaiting them, and to whom the last few minutes up the bay seem like hours.

#### NAVAL LAUNCHES CRITICIZED.

Criticism of naval launches has been aroused by the fatal accident at Hampton Roads in which eleven men lost their lives. *The Army and Navy Register* says:

"Referring to the deplorable accident to the Minnesota's steam launch, all the newspaper accounts have contained the statement that the boat must have been run down and cut in two, otherwise she would have been kept afloat by her water-tight tanks. The statement is wholly in error, as these launches will not float when filled with water, as has repeatedly been shown by the simple fact that every time they fill with water they sink, and this can be demonstrated at any time by testing any launch in the fleet while equipped with canopy, etc., for regular service work. The navy has lost a considerable number of launches in this manner, or has been put to the trouble of raising them from the bottom.

"Moreover, these launches are veritable death traps in case of an accident in bad weather, because they carry a heavy roof-like canopy, extending from the forecabin to the stern, and in rainy or rough weather the sides are completely inclosed by canvas curtains, securely lashed to the roof and the rail of the boat, thus forming a canvas deck house, which incloses all the occupants of the boat, both passengers and crew, and without a single opening, except a peep hole in the forward end for the coxswain.

"The boats are built for comfort, and they accomplish the purpose of their design, as a passenger in rainy weather is as completely protected as though he were in a closed cab; but in case of accident while thus securely lashed in, an expert swimmer provided with a life belt has no possible chance of escape, even though the boat sinks within easy swimming distance from the shore. He cannot even hope to be heard if he cries for help.

"These boats are the laughing stock of all navies, being unique of their kind. No other nation builds such 'comfy' boats, or such poor sea boats. No other nation fits its boats with a fixed canopy supported on an iron framework and covered with dozens of coats of paint."

Rear Admiral Joseph B. Coghlan, retired, when shown the article said:

"The launches in the United States navy are the best afloat, by far. They do have canopies, but they also have curtains, and it is the officer's own fault if he lashes the latter down so as to make escape in case of an accident, difficult. But, anyway, they are held down by little ropes which it would be the easiest thing in the world to cut with a penknife. There are no better launches on earth than our 36 and 40-footers. As

for being built for comfort, that is a secondary consideration, for what they are really built for is use."

#### FOUR MONTHS' CLYDE SHIP BUILDING.

The total output of new tonnage on the Clyde for the four months of 1907 now completed is an advance on last year's output for the same period by close on 20,000 tons. The largest item contributing to this result, so far as April is concerned, was the Allan liner Corsican, launched by Barclay, Curle & Co., Whiteinch, twin-screw steamer of 12,000 tons with triple-expansion engines of 8,500 I. H. P. One of the smallest, and perhaps the most interesting items, however, was the twin-screw motor vessel Scout, of about 106 tons, launched by the Ailsa Shipbuilding Co., Troon, for David MacBrayne, Ltd., Glasgow. This vessel is being fitted with oil engines by the Griffin Engineering Co., Bath. The advance on the four months' output of last year of about 20,000 tons is, of course, also a much greater advance on previous record years; for example, 1905, with 141,000 tons; and 1902, with 140,000 tons. It must, however, be remembered that except for the Indomitable, of 17,250 tons displacement, launched by the Fairfield Shipbuilding & Engineering Co., in March, no vessel approaching the tonnage of the Cunard Lusitania will fall into the coming year's record, except the sister ship to the Indomitable, to be launched within a month by John Brown & Co., Clydebank, and thus the first four months of the year are likely to carry off the honors in the matter of creating a good year's—but doubtfully a record year's—amount of work.

#### JAMAICA BAY COMMISSION REPORTS.

Maps, tables of estimates, correspondence, in all more than 160 printed pages, are required to set forth the facts relating to the improvement of Jamaica Bay as reported by the commission appointed by the mayor of New York, pursuant to a resolution of the Board of Estimate, dated March 2, 1906, made public recently. The commission was not confined in its investigation except by the exclusion of Manhattan Island and it clearly regards this large territory bordering upon Brooklyn's and Queens' rapidly growing suburbs as of chief importance.

The majority report assumes there is no occasion to fear that New York will lose her commercial supremacy, but adds that the port must provide in 1915 accommodation for one and a half times the amount of shipping for which it cared in 1899; in short, for an increased tonnage, making a grand total of 122,450,000. Jamaica Bay water front is

claimed by the city although the state also asserts title but the commission believes that the city can make good its claim. The bay presents a water surface of 16,170 square miles. There is beside marsh land, sometimes overflowed, making a total of 23,870 acres. The city's share, the commission thinks, would be 4,660 acres, while 9,000 acres should be acquired by purchase. The cost of the land is estimated to be \$4,500,000, filling in at \$26,781,600, and timber and concrete bulkheads would bring the city's entire bill up to \$36,423,120. The commission holds the scheme for deep water dredging entirely feasible, thus affording ample wharfage accommodations.

#### CONSOL. STEAMSHIP LINES CO.

The gross earnings of the Clyde Steamship Co. for the first quarter of the current fiscal year ended March 31 were \$1,283,014, an increase of \$46,284, or 3.7 per cent over the corresponding period of 1906.

The gross and net earnings by months for the first quarters of 1907 and 1906 compare as follows:

Month.	Gross	Net	Gross	Net
Jan. ...	\$ 428,151	\$100,157	\$ 440,497	\$105,111
Feb. ...	387,959	75,142	357,257	76,691
Mar. ...	446,903	116,819	438,975	120,240

Total . \$1,283,014 \$292,118 \$1,236,730 \$302,043

The decrease of \$9,925 in the net earnings for the quarter was caused by unfavorable weather conditions, and by the tie-up incident to the long-shoremen's strike in New York. Several of the northern rivers which the Clyde line navigates in making entry to some of its northern ports were frozen up by the severe winter weather at different times, resulting in temporary interruptions to the regular service.

The Clyde line has now been under the Morse management for more than a year and it is hardly to be expected that the results of 1907 will show the phenomenal increase over last year which 1906 showed over 1905, both in gross and net business. For example, net earnings in the March quarter of 1906 increased fully 110 per cent over the same quarter of 1905. This was the result both of a large gain in gross, of economy of operation, and of mild winter weather conditions.

#### EUROPEAN-CANADIAN ROUTE.

The Canadians are trying an interesting experiment at North Sydney in an effort to expedite their European mails, thus still clinging to the notion that the waters off that coast are navigable. The scheme is to take off and put on there the mails and passengers of the steamers running to and from Quebec, thereby saving the difference of time between that

taken by the ships and by the railway trains, the one in traversing and the other in skirting the Gulf of St. Lawrence. The attempt to put this fine idea into practice came near being fraught with disaster. The little government steamer Montcalm left Sydney harbor with the mail bags that had left Quebec by rail seven hours after the steamer Virginian, of the Allan line, and after a perilous attempt to make the transfer, which had to be abandoned owing to the heavy seas which prevail there, the two vessels steamed well up into the harbor where 52 passengers and 334 packages of mail were successfully transferred to the liner. Much of the time which it was expected would be saved was lost and the smaller steamer received, in addition, very serious injuries. Still, the mail steamers are to continue to make these transfers until the Belle Isle route is opened, and it is said that this will result in a quicker delivery of the mails at Montreal, while the coast provinces will receive their European mails from 24 to 36 hours sooner than they would if the vessels made no stop before reaching Rimouski.

#### NEW ZEALAND LOSES STEAMER CONNECTION WITH SAN FRANCISCO.

The withdrawal of the Oceanic Steamship line from the New Zealand and Australian service has checked the trade between the United States and Australia. In 1905 the trade between Australia and the United States showed a balance of \$3,611,000 in favor of the United States. In the last ten years the trade between America and the British colonies in the South Pacific ocean had increased, according to the report of the American Consul-General at Auckland, New Zealand, 250 per cent. This trade had already reached considerable proportions and was growing. The lack of mail service has checked it. The passenger and mail service from New Zealand by way of San Francisco gave the colony its quickest means of communication with London and brought many American visitors to New Zealand. These tourists visited the springs and health resorts of New Zealand and spent money there. The colony, however, is partly to blame for the withdrawal of the trans-Pacific steamship line, for it is admitted that the subsidy paid by New Zealand for the mail service was not large enough. But the real and determining cause of the abandonment of the colonial service was the refusal of congress to authorize the payment of subsidies to the American mail steamers and merchant marine.

The ship owners of Canada are taking advantage of the situation and are making efforts to establish relations with

Australia and New Zealand. An exhibition is being held at Christchurch in the South Island of New Zealand. The United States, though it has a large and increasing trade with the colony, has erected no building and made no exhibit at the Christchurch exposition. Canada, though her trade with New Zealand is of small importance, has been wise enough to erect a handsome building and sent an attractive display of the products of the Dominion to the exposition.

#### AMERICAN MERCHANT MARINE.

"When American merchants have to send their good to Liverpool to be re-shipped to South America, it is high time for us to get busy."

This was the keynote of a strong plea for an American merchant marine and an extension of American trade to the South American republics, made before the men who guide the nation's credit, by Frank S. Dickson, assistant adjutant-general of Illinois, who had come to Chicago to welcome 700 delegates of the National Association of Credit Men in behalf of Governor Deneen. With a force typical of a young man, the adjutant-general, who was the youngest member of the 59th Congress, pictured the need of "American ships, under the American flag, to carry American goods."

Mr. Dickson was the first speaker at the 12th annual convention of the organization, which held its initial meeting of a three days' session in the banquet hall of the Auditorium Hotel. The speaker told of his recent tour of inspection of the Panama Canal and pointed out the apparent lack of interest of American manufacturers in the opportunities of the South American trade.

"With an area of 7,520,000 square miles, twice as large as the United States, American merchants control only 12.6 per cent of the trade," said Mr. Dickson. "Of the 4,742 vessels which entered the harbor of Rio Janeiro last year, there were only seven which carried the American flag and two of these were in distress."

He urged that the members of the organization use their influence with their representatives for the establishment of a merchant marine. The things that were necessary to get the trade to which we are so close geographically, the speaker said, were to send representatives who speak the native tongue of the countries, manufacture such goods as they want and to adjust the credit system to meet their requirements, a feature studied and carried out by English and German merchants and finally the establishment of American banks.

### THE SUEZ CANAL.

The report read by the president, Prince Auguste d'Arenberg, at the fifty-third annual meeting of shareholders of the Suez Canal Co. in Paris, is as follows:

The traffic through the canal, which had slightly declined in 1905, recovered in 1906 and somewhat exceeded the level attained in 1904, the highest then reached. The reduction in the dues applied from Jan. 1, 1906, might have caused a decrease of nearly ten millions in the receipts, but the loss was less than six millions, as the difference was made up by the increase in the tonnage. The prudent provisions you adopted in the accounts for 1904 and 1905 would have permitted us to provide for less favorable results. We are consequently enabled to propose to fix the dividend for 1906 like that of the two preceding years, at 141f. net, while making large appropriations to the statutory reserve and the amortization fund.

The total receipts in 1906 amounted to 111,989,122f., which was a decrease of 5,319,073f. on 1905. The loss of 5,868,135f. in the navigation dues was, however, set off by an increase of 550,000f. in the receipts. The total expenses, which amounted to 42,279,469f., including a transfer of 4,000,000f. to the amortization, and 150,320f. to the insurance and casual funds, were 1,295,285f. more than in 1905. The greater part of that increase was due to works of maintenance. The surplus of receipts over expenditure shows, compared with the year 1905, a diminution of 6,614,359f. and amounts to 69,709,653f., or, after an application of three per cent or 2,091,289f. to the statutory reserve, to 67,618,363f., to which has to be added 15,672f., carried over from 1905, and forming a total of 67,634,036f. We propose, in order to pay a net dividend of 141f., to take a sum of 3,800,000f. from the special reserve, constituted from the surplus profits of the two preceding years, so that the total sum available for dividend is 71,377,464f. This dividend will absorb 71,377,464f., leaving 56,571f. to be carried forward.

The expenses representing the cost of the ship canal are entered in the inventory at a sum of 612,486,201f., which, as compared with the year 1905, is an increase of 6,435,744f., corresponding to the work of improvement during the year. The value of the plant and buildings increased in 1906 by a sum of 444,023f., making a total of 48,752,673f., the difference being due to the surplus in the cost of new material over that disused. The value of that struck out of the inven-

tory was covered in the great part by the amortization fund, which, with the addition of the sum realized by the sales of old stores, increased on the year by 3,788,486f., and amounts to 41,879,020f. The insurance fund had to be debited the expense caused by an accident to one of our dredgers. On the other hand it has been credited with a benefaction of 150,320f., which restores the fund to its former amount of 1,500,000f. The statutory reserve, with the appropriation of 2,091,289f., now amounts to 25,570,206f., and the special reserve of 8,000,000f. is reduced to 4,200,000f. by the application of the sum required to complete the dividend for 1906.

During the year 1906, 3,975 vessels, representing 13,445,504 tons, passed through the canal. Compared with 1905 there was a decrease of 141 in the number of ships, but there was an increase in the tonnage of 311,399 tons. The development of the traffic in 1906 was, therefore, evidently due exclusively to an increase in the average tonnage of the ships. We have had frequently occasion to remark on the importance of that fact from the standpoint of the company's receipts, and the movement was especially accentuated last year, the average tonnage per ship, compared with 1905, having increased from 3,191 tons to 3,382 tons.

An important modification was recently introduced into the regulations concerning the passage of vessels carrying petroleum in bulk. Although the change took place since the year covered by the present report, we have thought necessary to explain it to you. When in 1891 the passage of ships carrying petroleum in bulk was authorized, the company imposed certain conditions, limiting the permission to the carriage of refined petroleum, and explicitly excluding crude petroleum and essences. In consequence, however, of the considerable importance resulting from the development in the use of automobiles and the consumption of the essences of petroleum, the company was solicited by the owners of vessels which now import that liquid from the Dutch Indies by the Cape of Good Hope route in great quantity. We were led to admit that we could not maintain the interdiction resulting from the regulations adopted in 1891. After an inquiry at the principal ports at which the cargoes of essences in bulk were imported, we decided on authorizing in principle the transit of such cargoes by the canal. But at the same time we established a series of regulations of a nature to remove all risks

of danger, and ensure the safety of navigation in the canal.

The ship canal and the Port Said channel were maintained in a good condition of navigability in 1906 by the extraction of 167,697 cubic meters of dry earth and 2,602,716 meters cube of dredging, of which 1,475,843 were in the canal proper and 1,126,873 at Port Said. In conformity with the program already laid before you, the dredging is being carried to a depth of 10½ meters. At the end of 1906 there were only a few points where the depth was less than 9½ meters. When the works undertaken this year are completed, the depth will be secured all along the canal line. We have, in consequence, decided to increase to 8.53 meters (28 English feet) from Jan. 1, 1908, the maximum draught for ships, which is now 8.23 meters (27 English feet). In order to be able to maintain and improve the soundings in the roads and the pass to the entry of Port Said, we have ordered from Messrs. Lobnitz & Co., of Renfrew, a third dredger, similar to the Ptolomee, supplied to us by the same builder in 1905. That vessel, which will be capable of dredging to a depth of 14 meters, will be one of the most powerful in the world.

### LLOYDS REGISTER OF YACHTS.

The 1907 edition of Lloyds Register of American Yachts, now in its fourth year, is just from the press. The book contains the full particulars of nearly 3,500 yachts owned in the United States and Canada, together with the names and addresses of their owners, 1,872 colored illustrations of private signals, and over 300 club burgees. The officers of nearly 350 yacht clubs and yachting associations are also given, making the book an indispensable acquisition to all persons interested in yachts and yachting. All the yachts in the book are grouped in one alphabetical list regardless of types of hull, rig, or means of propulsion. This system was determined upon because there is now no clearly defined line between power and sailing yachts and there is a constant changing of yachts from one division to another. As is usual with all of Lloyds publications, the work has been most thoroughly done. The price of the book is \$7.50 and applications for it should be addressed to Lloyds Register of American Yachts, 15 Whitehall St., New York.

The barge Montezuma, which was aground at the Lime Kilns for over a week, was released last week by the lighter Newman.



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### IMPROVING DULUTH HARBOR.

On Tuesday, Wednesday and Thursday of last week the second board of United States Engineers appointed within a year to consider the matter of improving the harbor at Duluth, met at that city, examined the harbor, listened to the opinions of the local interests represented at a public meeting and discussed the problems with the local United States engineers. No information concerning the opinion arrived at by the board was given out. The public meeting however brought out a number of points which will doubtless influence the board in its final decision. Dock owners, marine men and citizens of Duluth seem to be practically unanimous in their favoring of the breakwater plan and but one man who has in the past represented the interests desiring the central canal

made any substantial arguments for that scheme. It is to be regretted that both propositions were not presented on the same basis.

As recorded in editorial comment in the MARINE REVIEW of Aug. 9 and Dec. 13 a board of engineers was appointed last year for this same purpose, who having duly visited Duluth and studied the situation as thoroughly as possible, recommended certain improvements for the Superior entry, which are now being carried on. The significant fact remains that the board made no further provisions for the altering of the Duluth entrance, but stated on the other hand that were the present Duluth canal not already built a recommendation would have been submitted to construct a canal through Minnesota Point, farther to the south, or as more commonly spoken of, a central canal.

While no official explanation of the report has been vouchsafed the inferences to be drawn from it are fairly clear. First, the locating of the Duluth canal, as it now is rather than opposite the entrance to the river, was in the opinion of that board a mistake and that so far as the two canals are concerned, considering all the arguments as to inner harbor conditions, dangers and advantages to vessels entering port and the topographical situation, a central canal is the proper entry. This belief would, of necessity, carry with it whatever protection the central canal would require and had the present canal not entered into the question there seems to be no other interpretation of the former board's report than that a central canal was desirable regardless of the cost.

As a preface to the second inference it may be pointed out that no board would have any reason for neglecting to recommend such improvements as it saw were necessary even if it could anticipate that another board would be appointed to consider the same matter before any occasion demanding the improvement would arise. It remains a fact however, that the board last year saw fit to leave the Duluth canal just as it was, despite the strong arguments that were made then for the breakwater. The second inference

seems to be therefore that at the first investigation, whether or not the breakwater was considered a menace to navigation it was at least not considered a solution of the problem. In other words the conditions at the Duluth entrance as they are now would not be sufficiently improved by the building of a breakwater to justify the undertaking. No other conclusion is patent since the board had full power to recommend.

As opposed to what appears to have been the opinion of this board, the opinion of the many experienced engineers, marine men and business men having marine interests at Duluth, which opinion is practically unanimous in its support of the plan to build a breakwater out from the north shore far enough to run past the canal entrance and far enough from it to provide a large anchorage of sheltered water for the entering fleets in time of storm, carries much weight. The wish of Duluth and Superior may be said to be the building of such a breakwater. All interests are united however in an urgent plea based on business conditions and prospects at Duluth that whatever be found to be the adequate solution in the minds of those best qualified to judge, that plan should be recommended and carried out to completion. From the standpoint of expense it was argued that the great shipping to be benefited would justify the necessary cost. Duluth can, therefore, scarcely object to the central canal with any great consistency on the grounds of expense and in any case the expense is entirely the government's consideration. If the government were disposed to debate between the two plans on the question of cost and favor the less expensive regardless of final effectiveness there might be some wisdom in asking for what is most likely to be obtained but the utter lack of evidence of any disposition on the part of the government to do anything but what will afford a final solution of the difficulties at the head of the lakes, obviates this viewpoint and places the entire discussion on the basis of the relative merits of both projects.

The opposing ideas are briefly these. Those favoring the central canal, and they may be classed as the vessel interests all over the lakes, believe that the central canal is the necessary and proper improvement and that it was so conceded by the last board. They contend, therefore, that if the central canal is the correct entry, the interests at stake are great enough to justify the government in providing the entry, now that the error of building the other canal is discovered, instead of jeopardizing property of much greater value than the canal by continuing in the mistake, or, instead of throwing good money after bad by attempting to patch up a situation that may even be made the more dangerous thereby and at least will always be unsatisfactory. The advocates of the breakwater are not only those who believe that the breakwater with the present canal is the only correct entrance but also those whose opinion is controlled by the fact that the present canal is already built and who say, "What is the use of throwing away what we already have."

The arguments in support of each belief have been given in more or less detail heretofore and practically the same ground was covered at this investigation as at the previous hearing. The situation briefly is this: Especially unfavorable conditions unlike those at other lake harbors exist at Duluth because of its location at the end of the long narrow western point of Lake Superior where the prevailing northeast wind is focused upon the harbor, raising heavy seas and driving the water up into the bay through the entrance. From the navigator's standpoint, beyond the dangers that attach to making an entrance into any harbor, the unusual difficulties are—remembering that the majority of boats come to Duluth light—handling the boat in the gale, meeting the outgoing current at the canal entrance, a current that results from the piled up waters in the bay, and maneuvering the short turn immediately inside the canal which does not allow a boat to make a run for the harbor under full headway. More room is the eminently desirable feature, for it is only reasonable to sup-

pose that whatever the weather conditions, one point would be practically as easy for a captain to find as another and should he miss the entrance the result would be equally disastrous save perhaps at some point on the sandy beach of Minnesota Point.

From the harbor standpoint the cry for improvement comes because of the surging waters in the bay during a storm with the resulting large damage to dock property and delay in shipping. All the arguments and differences of opinion have resulted from the attempt to provide for both sailor and harbor. If no solution is possible whereby both may be equally protected it is to be hoped that the lesser need will cordially support the protection of the greater.

The breakwater should be built, it is claimed for the following reasons. It will protect the present canal and prevent harbor conditions now prevailing. It will provide a sheltered harbor for vessels and quiet water in which to make the entrance. It will afford the much needed anchorage ground at Duluth. It is the least expensive proposition possible. It will not obstruct the ship course into the harbor and it will avoid the great danger now existing of a boat going down in the canal without the possibility of notifying following boats of the obstruction. Taking issue with these statements it is argued that a breakwater jutting out into the lake cannot be other than an additional menace to navigation, that room is already much too cramped and that a 600 foot boat would not be able to shape her course for the entrance after running in by the breakwater without difficulty and that it is not so much rough water but the wind that is difficult to combat.

In support of the central canal it is argued that a wider canal should be built, that a great shortening of distance in making their docks would result for the large majority of boats and that a central canal would be the easiest and safest entry for the navigator. It is also claimed that a central canal can be so protected as to bring no additional disadvantages to the interior of the harbor. It is conceded

that the central canal will be the more expensive construction but laying this consideration aside there seems to be no substantial refutation of the above arguments in favor of the central entrance.

The engineers have an interesting controversy to decide and one in which the weight of evidence on both sides for one reason and another demands careful consideration. The recommendation of this board should cover the situation and should be final. Adequate opportunity has been afforded for investigation. A report is expected which will provide for the situation and when given should be accepted as the wisest solution discernible.

### FREIGHT SITUATION.

When the figures for the present month of June are in they will probably offer new evidence of what the lake fleet is capable of doing. The weak link in the chain has not been the ships but rather the docks, but docks have during the past two years undergone considerable transformation and notably so within the past year. The largest cargoes are being discharged easily in a working day. It is quite probable, therefore, that the June record will be heaviest yet attained on the lakes, the ore movement alone being well over 6,000,000 tons. Notwithstanding the freedom with which ore is moving there is a fine demand for tonnage all around. The lake trade as a unit was really never in better shape than now. Vessel owners in general are so well taken up with contract ore that there is little tonnage on the market.

Coal is moving forward freely, but the rates for the great proportion of the movement are the same as they were at the opening of navigation, though small cargoes to Lake Michigan ports command a premium.

The grain trade from Chicago is quite attractive to the smaller class of vessels, figuring about ten cents better than the rate on ore from Escanaba.

The Weston Transit Co. has taken Capt. John Hesson and Engineer Cottrell, of the steamer Wm. B. Kerr, to supervise the construction of the steamer W. M. Mills at Lorain, and placed Capt. George Honner and Engineer Harry Depuy in charge. Capt. Thomas Derringer will bring out the new steamer Leland S. DeGraef and Frank Trunwalder will be her chief engineer.

# HAMBURG-AMERICAN PACKET CO.

## The Interstate Commerce Commission Will Investigate Charges That It is a Monopoly in Restraint of Trade.

Charges disclosing an ironclad trust in trans-Atlantic freight carrying—a combination accused of defying the United States laws and using the most drastic of illegal coercion—have been filed with the Interstate Commerce Commission against the Hamburg-American Packet Co. The commission has decided to begin an inquiry, which will be one of the greatest ever undertaken in this line.

The complainant is the Cosmopolitan Shipping Co., of Philadelphia, operating lines to Rotterdam, Leith, and Copenhagen. This company raises a great national and international question in charging that the huge combine is a monopoly in restraint of trade, in its almost absolute control of east-bound and west-bound traffic between interior points of the United States and Hamburg, and, further, that it maintains a law-defying pool in New York City, which dictates the rail and ocean routes by which freight for Baltic ports shall be shipped, the percentage of traffic which steamship lines in the pool shall carry, and the percentage of export business that shall pass through Boston, New York, Philadelphia, Baltimore, Norfolk, and Newport News.

In other words, it is charged that this great corporation, backed by the German government, dictates terms, rules, and rates to shippers all over the United States who forward goods to Hamburg and Baltic ports; and further, that it diverts freight to and from American ports at its own will, without regard to the natural flow of trade, using coercive and unlawful methods to crush competition.

The Cosmopolitan Line's complaint, formulated by Frank L. Neall of Peter Wright & Sons, of Philadelphia, the general agents, distinctly disclaims objection to competition. But it adds:

"We do believe, however, that pooling, combinations, and intimidations, the latter in certain instances approaching blackmail, are not legitimate forms of competition."

The complaint alleges:

"1. The Hamburg-American Packet Co. maintains and manipulates a monopoly of westbound or import traffic forwarded on local and on through bills of lading from Germany and other Continental countries, per the German State railroads, etc., via Hamburg and destined for the United

States cities of Chicago, St. Louis, Kansas City, Omaha, Duluth, Minneapolis, Cleveland, and other consuming centers to and, or through the North Atlantic ports of Boston, New York, Philadelphia, Baltimore, Norfolk and Newport News.

"2. Restraint of trade and monopoly of eastbound traffic by the Hamburg-American Packet Co., originating at interior points within the United States and destined to interior European countries via the United States north Atlantic ports of Boston, New York, Philadelphia, Baltimore, Norfolk and Newport News, and Hamburg, Germany.

"3. Pooling in restraint of trade by the Hamburg-American Packet Co. of traffic originating at interior points within the United States destined for Baltic ports."

The complainant also alleges that the Hamburg-American Packet Co., together with the other members of the pool, has divided the field, stipulating the per cent of traffic each subsidiary is to carry, and dictating the rail and ocean routes for freight for ports on the Baltic, and also determining what percentage of traffic each of the six Atlantic ports in this country, mentioned in the complaint, is to be given.

It is charged that this great monopoly is backed by the German government and that among the subsidiaries controlled by the Hamburg-American Packet Co. are the North German Lloyd, Scandinavian-American, and Wilson (Hull) lines, controlling in this vast combine 97 per cent of the traffic of the Atlantic to Baltic ports, originating in the United States. The percentages are alleged to be as follows:

	Per cent.
The Hamburg-American Packet Co., via Germany	56
The North German Lloyd, via Germany	17½
The Wilson (Hull) lines, via England	2½
	76
The Scandinavian-American line direct to Denmark	24
	100

The complaint, continuing, says that "the volume of traffic assembled in each of these seaports is so distributed as to insure each of the respective members of the pool their arbitrarily agreed upon percentage of the traffic actually moved. These percentages are regulated and controlled in New York by means of frequent

reports and comparisons of records.

"When a given line is ahead of its pro rata as agreed in the pact, its rates are temporarily advanced so as to put it out of the market while the services that were behind their assigned percentages in the pool maintain their old rates or, when necessary, lower them temporarily until after their apportioned percentages are recovered.

"Such an apportionment among the respective members of the pool involves the determination both as to kind and amount of the traffic originating in our western cities which is to be forwarded to each of the ports on the Atlantic seaboard. This is discrimination.

"The Hamburg-American Packet Co., the aggressive, predatory commercial advance agent of the German imperial government, is the greatest steamship monopoly in the world. Its lines reach almost every country on the globe.

"It has a fleet with a gross registered tonnage of approximately 1,000,000 tons. Its ambition is world-wide, and to reach its end it would crush out all competition.

"The blighting effect of this foreign monopoly is soon told. For many years the congress of the United States, the successive administrations, and the vast commercial interests of the country have legislated and striven to build up and restore our lost prestige and ascendancy on the seas. Many of our statesmen have even advocated subsidies as a means to this end. With what result? Thanks largely to the overshadowing influence of this corporate mammoth—the Hamburg-American Packet Co.—the total merchant marine (steam) of the United States, in vessels of 2,000 gross tons register or over, that is, of vessels capable of performing trans-Atlantic or trans-Pacific voyages, represents a tonnage of only 935,000 gross register; less than the tonnage of this one German line—the Hamburg-American Packet Co."

In conclusion it is claimed:

"First. That the Hamburg-American Packet Co. is a monopoly in restraint of trade, exercising through its contracts the power to control traffic both eastbound and westbound, between Hamburg and interior cities in the United States and to determine

the rates and routes for such traffic.

"Second. That the Baltic pool, of which the Hamburg-American Packet Co. is the controlling factor, is a combination in restraint of trade, dictating the percentage of traffic, from interior cities of the United States to Baltic points, which shall flow through each of the north Atlantic ports mentioned, to the end that each of the lines composing the pool may receive its allotted proportion of the business and no more.

"Third. That the wise and careful efforts of the Interstate Commerce Commission to preserve the equality of opportunity of these north Atlantic ports and to prevent discrimination between them is nullified by this arbitrary division of traffic between the lines of the Baltic pool.

"Fourth. That the acts complained of in this petition are in violation of the laws of the United States.

"Fifth. That the efforts of congress and of the recent administrations to rehabilitate the American merchant marine have been hampered and rendered abortive by this monopoly and combination.

"Sixth. That there is little use in advocating further legislation proposed for the benefit of our shipping if at the same time we allow our present laws to be violated by an unscrupulous foreign corporation in its efforts to suppress American competition on land and on sea."

Representatives of the big foreign shipping companies accused of this combination in restraint of trade have spoken in the defense of their respective lines in the public prints averring the charges to be untrue. Mr. Emil L. Boas, general manager of the Hamburg-American line, said: "There is a great deal of notoriety seeking in this thing. I understand that Peter Wright & Sons have a monopoly of the towboat business in Philadelphia, and when the first Rotterdam liner went to that port they refused her a tug. That shows how these champions of free and unrestricted trade act in their own field."

Gustav Schwab, general manager of the North German Lloyd line, said: "I have nothing to add to the remarks made by Mr. Boas, against whose line the complaint is brought, except to say that the inference conveyed is an attempt to arouse a feeling against foreign steamship lines. That the complaints represent American capital I deny, for the line is owned by foreign capital, and not by American. I do not care to go into the subject further."

That the complaint is not based

upon accurate reports is the opinion of Manager Sanderson of the Wilson line, whose steamers run to Hull. "The report is very incorrect," he said, "and I think that those making the report are mistaken. We have no such arrangement or agreement as charged."

Paul Gottheil, manager of Funch, Eddy & Co., 8 Bridge street, who act as freight agents for the Scandinavian-American line, said: "If you could see the amount of business we do at almost ruinous rates you would not think we were in a combination for the restraint of trade. If you will compare the freight rates from New York to the Baltic you will find them in many instances less than to Philadelphia, and decidedly less than from New York to gulf ports. I think that the Hamburg-American line has done much to develop the foreign trade of the country.

"Our own service has done much to develop trade to Scandinavian ports. The farmers of the west, the milling industry, and the manufacturers are enabled to compete with Europeans at a minimum cost. In the last industries rates have been made which make possible competition with Germany and England."

The Cosmopolitan Shipping Co. in its complaint states that it does not "seek to have ameliorated any of the conditions which fair competition may impose, but believes that pooling, combinations and intimidations, the latter in certain instances approaching blackmail, even under the semblances of competition, are not legitimate forms of competition," but on the contrary desires "to place themselves in line with the Interstate Commerce Commission in its recognized advocacy of the fullest freedom of competitive conditions."

#### STEAM YACHT REVOLUTION.

The steam yacht Revolution had official trial trip on the Hudson river last week with the new reciprocating engines and Seabury safety water tube boilers, which were installed to replace the Curtis turbine engines, recently removed by the Gas Engine & Power Co., and Charles L. Seabury & Co., Consolidated, Morris Heights, New York City. The run was made from Fort Washington Point to Ossining and return, the yacht averaging a speed of 21½ miles per hour, which was an increase of half a mile per hour over the contract guarantee. Everything worked very smoothly, to the entire satisfaction of Mr. F. Augustus Heinze, the owner, who was aboard, also Mr. E. C. Seldon, superintending engineer of the Clyde line, and Mr. Sanford Robinson,

who represented Mr. Heinze. The builders were represented by Mr. Charles L. Seabury, the designer of the boat and machinery. The yacht will now be placed in commission for Mr. Heinze's use.

#### MISCELLANEOUS.

An explosion of gasoline aboard the British submarine boat C-8 recently cost the lives of a lieutenant and three seamen. The explosion was due to an accumulation of gas. The submarine was not damaged. This is the fifth accident to British submarine boats since February, 1905.

The naval destroyers Blakely and Whipple were recently in a collision resulting in serious damage to the Blakely, although the Whipple was not injured. The Blakely has been placed in dry dock at the Norfolk navy yard. The accident was due to an error in the engine room, going ahead full speed when signaled to back.

The special board of naval officers which was appointed to investigate the collision between a government launch and Mrs. Alfred G. Vanderbilt's yacht Caprice has awarded damages in the sum of \$250 to her. The launch was returning from the German cruiser Bremen, lying in Newport harbor, and bore Rear Admiral John P. Merrell and several other naval officers.

The Jones & Laughlin Steel Co. is engaged in building 50 river barges, the most important work now in progress in the Pittsburg district. They will also start work soon on three tow boats of the larger type. The company is to have a complete fleet for bringing down coal and coke from the upper river points to the new works at Aliquippa.

A. D. Mearns has recently been appointed general manager of the Cunard Steamship Co., succeeding the late Mr. Moorhouse. Mr. Mearns' position as secretary has been filled by the appointment of Walter Dranfield. During the illness of Mr. Moorehead Mr. Mearns has filled the dual position of secretary and manager so he comes to his new office with every advantage to be gained through a working knowledge of the duties.

It is stated that it is probable that when the new Cunard liners Mauretania and Lusitania arrive at New York, which will probably be some time in the fall, it will be possible for them to enter via the new Ambrose ship channel. Work is proceeding on this channel at a satisfactory rate and the large German tank steamer Phoebe, drawing 20 ft. of water, made the passage of the channel without mishap last week.

Duluth, June 24.—Another record will be broken by the Duluth, Missabe & Northern docks for June. Already these docks have shipped over 1,500,000 tons of ore since June 1 and by the end of the month will have exceeded the 2,000,000-ton mark. Boats have been plentiful during the past week and the prospect is good for the next few days. A large amount of coal continues to arrive. The ore shipment figures for the head of the lakes for the week June 14-21 were as follows: Duluth 487,574 tons, Two Harbors 337,759 tons and Superior 285,212 tons, a total of 1,110,545 tons. During the same week a year ago Duluth shipped 357,960 tons, Two Harbors 290,801 tons and Superior 210,203 tons, a total of 858,964 tons or 251,581 tons less than this year. This year now has a margin of 1,395,044 tons over 1906.

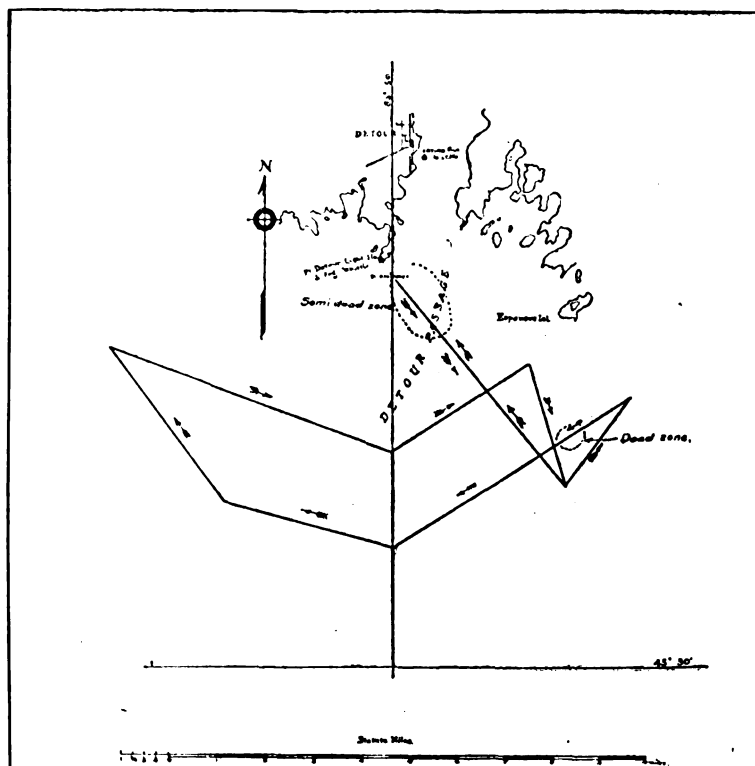
WEEK ENDING JUNE 22.		Receipts.	Shipments.
Wheat	.....	387,363	851,300
Corn	.....	8,051	
Oats	.....	31,206	133,961
Rye	.....	2,885	
Barley	.....	34,467	8,455
Flax	.....	111,177	262,875

The first half of the year is closing with an exceeding quiet market in iron and steel lines, but with no cause for alarm. Spot quotations for pig iron are lower, due to the furnaces' ability to furnish better delivery. Crude steel is easier. An adjustment of the negotiations between the Pennsylvania railroad and the Carnegie Steel Co. for the manufacture of the Cassatt rail at \$33 is believed to be probable. New rail business is heavy. The agreement between the American Sheet & Tin Plate Co. and the Amalgamated Association to maintain the present wage scale on sheets and tin plates precludes labor troubles for the coming year.

**Editor MARINE REVIEW:—**A statement made in your issue of May 16, tends to convey the impression that the Detour fog signal is defective. The Detour fog signal happens to have an unusually efficient and faithful keeper, and it is the best steam fog signal, so far as I know, upon the great lakes. Steam can be gotten up in from 10 to 15 minutes, and as a feed water heater is in practically constant service, the keeper does not hesitate to blow the signal whenever there is any possibility of its being needed. The author of the statement has explained it by saying that he believed there were silent zones around the sig-

The officers of the Ashtabula Steamship Co. are: E. S. Henry, president; George A. Gaston, vice president; E. W. Savage, secretary and treasurer. These in addition to T. J. Renicke, H. A. McKinnon, Oscar Olsen and Alexander Hynd, constitute the board of directors.

The 1907 edition of the Blue Book of American Shipping is just off the press. This book is the standard marine directory of the United States. It



A sketch herewith, shows the courses which were run, and the extent of the silent and semi-silent zones.

The Ashtabula Steamship Co., an organization composed of Ashtabula and Cleveland men is negotiating with the Great Lakes Engineering Works for a steamer to come out in the spring of 1908 and to be 440 ft. over all, 420 ft. keel, 52 ft. beam and 28 ft. deep. Such a steamer will have a carrying capacity of 7,500 tons on favorable draught.

contains the name of every vessel of American register, together with the name and address of the owner. This list is complete and embraces coast, lake and river vessels. It contains a list of ship owners, ship, engine and boiler builders, power and pleasure boat builders, manufacturers of gas and gasoline engines, names and addresses of naval architects, marine engineers and vessel masters. It is, in fact, a complete directory of everything pertaining to American shipping, giving particulars of vessels of the United States navy, dry docks of the United States, heads of government bureaus in the United States and Canada connected with shipping, public works contractors, wrecking companies, maritime associations, purchasing agents, superintending engineers, in fact a list invaluable to those who desire to reach the marine field. The Blue Book of American Shipping is published by the MARINE REVIEW and is for sale at \$5.00 a copy.

**BATTLESHIP AND ARMOR BIDS.**

Proposals for the construction of the two big battleships of 20,000 tons authorized by congress at its recent session were opened last week at the navy department. There were only four bidders, the Fore River Ship Building Co., of Quincy, Mass.; the Cramps Co., of Philadelphia; the Newport News Ship Building & Dry Dock Co., of Newport News, Va., and the New York Ship Building Co., of Camden, N. J.

Altogether, they submitted 15 bids for the various classes, including the department's designs and those suggested by the bidders. Between the highest and the lowest bids there is a difference of more than \$1,100,000, and while this is surprising to the department, it is no more so than the fact that the general average of the bids is so low.

The Newport News company underbid its competitors by many hundreds of thousands of dollars, and it is probable that this company will get one of the big ships, and that the other will go to the Fore River company, which was the next lowest bidder. The bids as opened are as follows:

Fore River company—Department's designs, \$4,400,000; class 3, builder's designs, Curtis turbines, to be delivered in 34½ months, \$4,377,000.

Cramps' company—Department's designs, \$5,100,000; classes 3 and 4, builder's designs, 36 months' delivery, speed 21 knots, Parson's turbines, but not including cruising turbines, \$5,050,000; same classes, slight changes, \$5,030,000.

Newport News company—Department's designs, 36 months' delivery, \$3,987,000; classes 3 and 4, Parson's turbines, and including cruising turbines, \$4,100,000; department's design, with builder's machinery, etc., Parson's turbines, \$4,050,000; same conditions, including cruising turbines, \$4,100,000; slight changes, and not including separate cruising turbines, \$4,090,000; same as last, with cruising turbines, \$4,120,000; slight changes, \$4,050,000.

New York Ship Building Co.—Department's design, \$4,545,000; department's design, with builder's design, machinery, etc., \$4,600,000, with Parson's turbines, but without separate cruising turbines, \$4,530,000.

Contract for one battleship will be given to the Fore River Ship Building Co. and for the other to the Newport News Ship Building & Dry Dock Co.

Bids also were opened at the department today for armor for the two big ships. There were three bidders: the Carnegie Steel Co., the Bethlehem Steel Corporation and the Midvale Steel Co. As heretofore, the bids of the Carnegie and the Bethlehem companies were identical, even to the date upon which deliveries would begin and a letter insuring the government against the payment of royalties on patent processes for armor making.

The bids of the Carnegie and Bethlehem companies were \$420 a ton for 7,456 tons, class A armor, and \$400 a ton for class B and C, of 952 and 392 tons respectively.

The bids of the Midvale company were \$410 on all classes and for the same amount as the other companies. The Midvale company proposes to begin deliveries within six months after the contract is awarded and continue at the rate of 60 tons a month. The other companies agree to begin deliveries on Dec. 20 and continue at the rate of 60 tons a month.

**TERMS USED ON SAILING VESSELS.****FOR WHEELSMEN AND WATCHMEN.**

Although you are in a steamboat, it is quite necessary to understand the meaning of the different terms and phrases used on a wind-jammer.

*In Stays.* The situation of a vessel after her helm has been put down and she has come up in the wind preparatory to going about on the other tack. "Helm down" or "down helm" means to put the helm toward the low side of the ship, which is always the lee side; that is, the side ship is listed on from the force of the wind on her sails.

*In the Wind.* When a ship is so close to the wind that all her sails are shivering or shaking.

*Keep Her Full.* An order to the helmsman to keep the sails full of wind.

*Keep Off.* An order to the helmsman to keep the ship's head more away from the wind.

*Keep Your Luff.* An order to the helmsman to keep the ship close to the wind so that the sails will shake or tremble slightly.

*Look Up.* A vessel is said to look up when by the changing of the wind she is enabled to point closer to the place of destination.

*Miss Stays.* When a vessel fails to go around in tacking she is said to miss stays.

*No Higher.* An order to the helmsman not to bring the vessel any closer to the wind. Steering high.

*Out-point.* For one vessel to sail closer to the wind than another is to out-point. Also known as sailing higher.

*Pay Off.* When a vessel's head falls off from the wind she is said to pay off.

*Wind's Eye.* The exact point from which the wind blows.

*Windward.* The point or direction from which the wind blows. Same as weather.

*Weather Helm.* A vessel carries a weather helm when her tendency is to come up into the wind, requiring the wheelsman to put the helm up. Helm up and weather helm mean the same, that is, put the helm toward the high side of the ship, which of course is always the weather side.

*Weather Shore.* The shore to windward, or the shore the wind comes from.

*Weather Side.* The windward side; the side the wind blows on.

*Helm Down.* To put the helm down toward the lee side, so as to bring the ship's head into the wind. Lee helm is the same thing as helm down or down helm.

*Helm Up.* To let the vessel go off from the wind by putting the helm toward the weather or high side.

*Helm's a Lee.* Signifying that the helm has been put over to leeward.

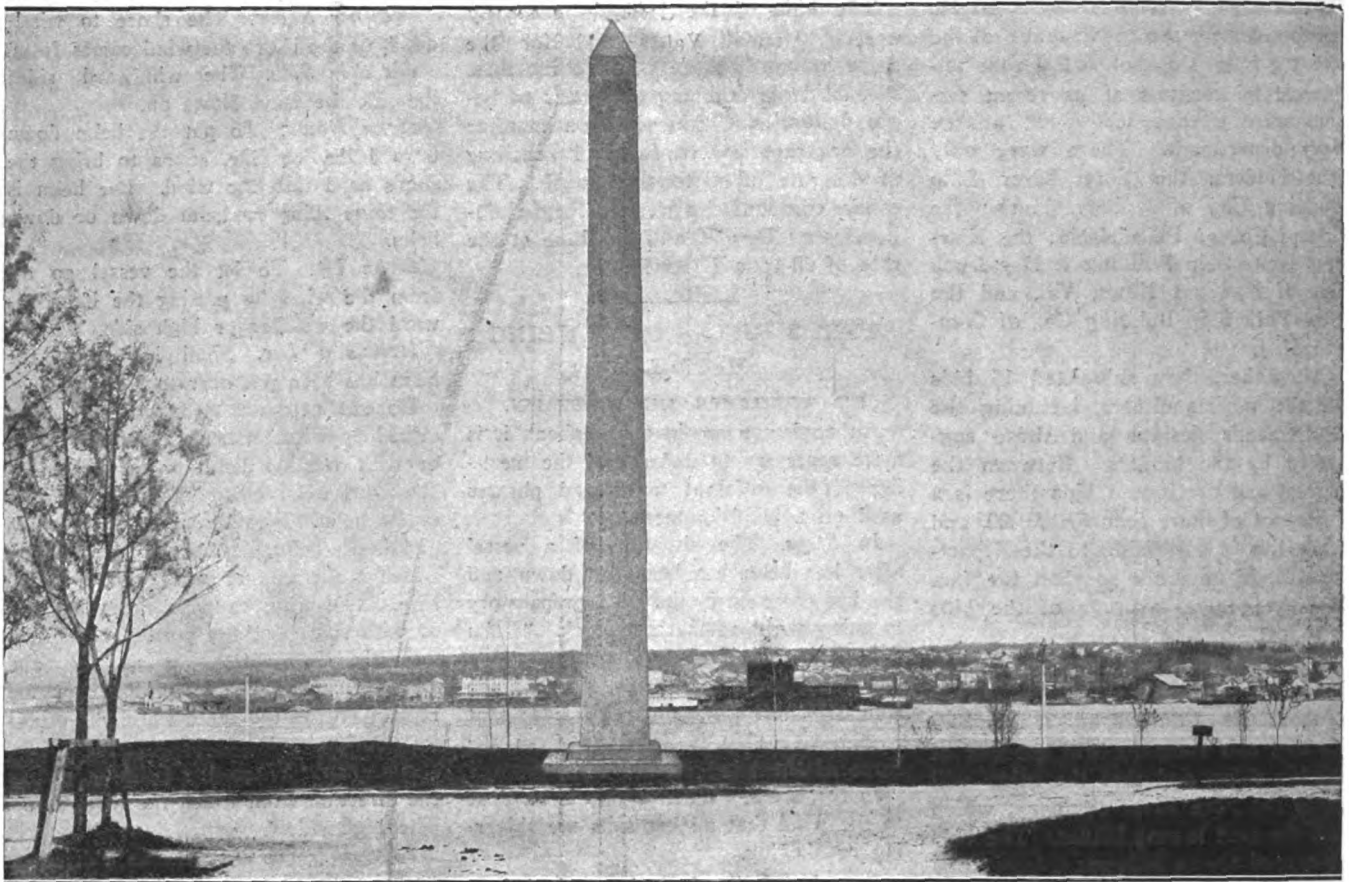
Do not get starboard and port helm mixed up with up helm and down helm, or with weather helm or lee helm, for starboard helm could be either weather or lee helm. Weather or lee helm or up and down helm, depend for their names which is the lee and weather sides of the ship. The wind controls them, but not so with starboard and port. These sides are not interchangeable as lee and weather. They are fixed positions and remain always the same while the others do not.

*Aweather.* When the helm is put in the direction from which the wind blows. The high side.

*Lee-ward.* The lee side. In a direction opposite to that from which the wind blows, which is called windward. The opposite of lee is weather, and of leeward is windward.

**TRIALS OF QUILPUE.**

The new twin-screw steamer Quilpue, built by Messrs. William Beardmore & Co., Dalmuir, Scotland, for the Pacific Steam Navigation Co., completed her trials recently at Liverpool. The Quilpue is the second of four similar steamers which Messrs. Beardmore are building for the Pacific company. The vessels have been specially designed for the Pacific west coast passenger and mail service. Their principal dimensions are as follows: Length between perpendiculars, 360 ft.; breadth, 46 ft.; depth, molded, to main deck, 25 ft.; height to spar deck, 32 ft. 9 in. The dead weight capacity is about 3,400 tons on the summer freeboard. The propelling machinery consists of two sets of triple-expansion engines of 3,300 I. H. P. Notwithstanding the stormy weather the results on the run around to Liverpool, from the Clyde, were very satisfactory, the stipulated horsepower having been largely exceeded, and the expected speed easily attained. The other conditions of the contract were also entirely fulfilled and the representatives of the owners expressed themselves as well pleased with the ship and her performance.



THE OBELISK AS IT WILL LOOK WHEN ERECTED IN LOCKS PARK, SAULT STE. MARIE.

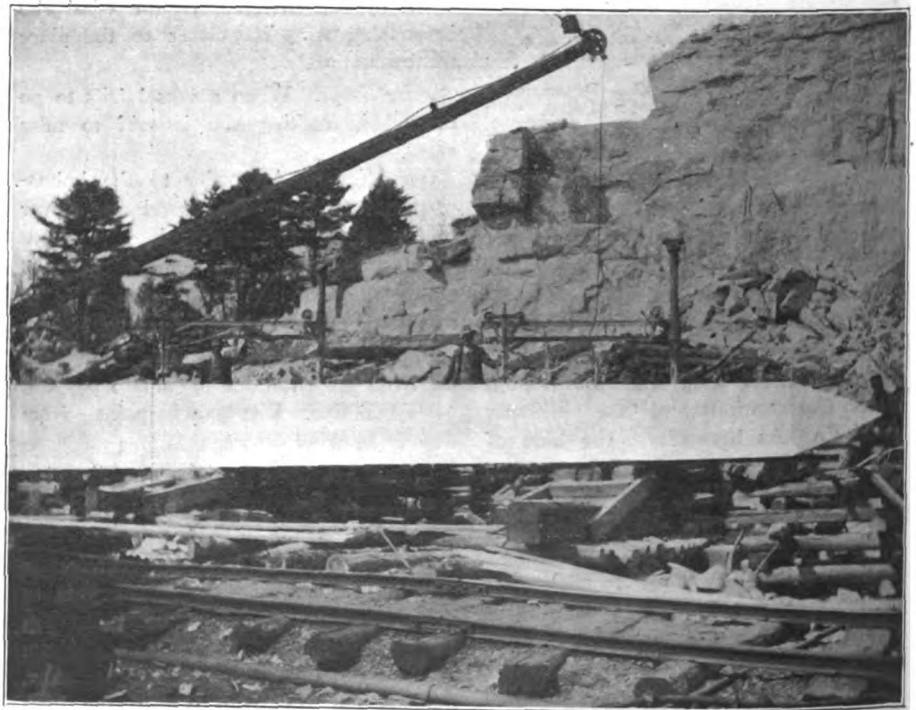
#### OBELISK AT SAULT STE. MARIE.

The semi-centennial commission appointed two years ago to celebrate the opening of the first canal at Sault Ste. Marie to commerce will some time during the present summer erect at Sault Ste. Marie an obelisk in commemoration of the event. The obelisk has been completed at one of the quarries at Branford, Conn. The shaft is of hammered Stony Creek red granite, is 45 ft. long, 5 ft. 5 in. square at the foot, tapering to a dimension of 1 ft. square and then finished to a point. It weighs about sixty tons. Its shipment has brought about a transportation problem that several railroad traffic men are figuring out. The only solution seems to be the use of a Pennsylvania railroad car which is used to transport heavy ordnance. The longest car available is 36 ft. and it will be necessary to mount a bed on swivels to carry the shaft and to allow for the sway of the shaft as the train rounds curves. When the question of routing the shaft was figured out, several traffic men had to give up the task, as they were not certain that all the bridges on their respective lines were capable of sustaining the enormous weight of the car and its load. About twelve years ago the battle shaft at West Point was cut at a quarry at Branford, and this had to be shipped in a roundabout way. It is 41 ft. long and

at that time was the longest shaft ever transported by rail in this country.

The monument is boxed and ready for shipment, and the foundations are now being prepared at Sault Ste Marie. The obelisk was designed by Charles I.

McKim, of the architectural firm of McKim, Mead & White. This firm also designed a battle monument at West Point and the monument of the prison ship martyr of the revolution erected in Brooklyn, N. Y. The contractors



THE OBELISK AT THE QUARRY.

are Norcross Bros., of Worcester, Mass., and Cleveland, O. The cost of the monument is \$19,000, which sum was contributed by the general government, the state of Michigan and the transportation and mining interests of the lakes. It will be erected at Locks Park, on the axis of Bingham avenue.

### SHORTAGES IN CANADIAN GRAIN CARGOES.

Editor MARINE REVIEW—Sir: I do not wish to enter into a controversy, regarding the causes leading to the shortage, and overrun on cargoes, shipped from Fort William and Port Arthur. In writing to you on the 6th inst. I intended only to give any one interested the benefit of my experience gained during the time I was employed at one of the Fort William elevators, as well as what I had learned while assistant in an elevator at a Georgian Bay port. At the latter I have seen a case, in fact, two or three cases, where one steamer followed the other at the elevator, in loading at the Lake Superior Canadian port, coming in like order at the Georgian Bay port, the first to fall short several hundred bushels, and the other to run over nearly a like amount. I also know it to be a fact the grain has been found in the shipping bins, after the vessel for which it was weighed had left port.

In so far as the wearing out of spouts is concerned, that cannot be confined to the Canadian ports alone; that will happen in all elevators that handle grain, and the Canadian elevators have just as good millwrights as those in our ports to look after this work. As for the reweighing of part of a draft, that would have to occur often, in order to create a large shortage, and would not of necessity have to fall on the shoulders of the loading port, for during my experience in the Buffalo elevators I have seen where shortages of 500 bushels were found to occur, same being located here after the cargo had been reweighed, or in loading to canal boats or cars. This, of course, could not happen through the reweighing of a part of one or of several drafts, but through both the weighman and tally man failing to tally one or more drafts.

If the cause of those large shortages was or could be put on the wearing out of the spouts, and the overflow of bins, there would be no overrun on cargoes; it would all be a shortage.

JOSEPH A. BOLAND.

Buffalo, June 21.

### AROUND THE GREAT LAKES.

The steamer Yale ran aground at Point Pelee near Southeast shoal on Lake Erie last week.

The steamer Smith Thompson, building for the L. C. Smith Transit Co., will be launched at Toledo on Saturday.

Capt. T. W. Walker, commanding the revenue cutter Tuscarora, will retire at the end of the present season, having reached the age of sixty-five years.

The steamer H. S. Pickands and the schooner Morengo have arrived at the yard of Abram Smith & Son, Algonac, Mich., for repairs to top sides.

The Reid Wrecking Co. has contracted to raise the dredge Sir Wilfred lost off Port Hope three years ago. It was not discovered until last fall.

The old side wheeler Urania has been restored to her original name Flora and will operate between Toledo and Cedar Point in connection with the steamer Eastland.

Marine interests at Tonawanda have started a movement to have the war department establish a flash range light at the entrance to Niagara river and a signal light at the mouth of Tonawanda creek.

D. O. Smith, of Port Washington, who purchased the hull of the passenger steamer Atlanta, has notified the collector of customs at Milwau-

kee that he will raise the wreck of the steamer Atlanta which was burned off Port Washington a year ago.

Capt. Thomas Johnson, assistant to the president of the Great Lakes Towing Co., has purchased the gasoline launch Bayou from the Buffalo Yacht club. The Bayou is 65 ft. long and is one of the finest launches on the lakes.

The contract having been let by the Lake Erie Dredging Co., of Buffalo, for removing the shoal that lies at the mouth of Buffalo harbor just outside the lighthouse on the long breakwater, captains of vessels are requested to slow down on entering port and give as wide berth as possible to the dredges and drill boats that will be at work upon the contract. The action of the swell from wheels of passing steamboats is very apt to break the anchors or spuds on the dredges or drill boats.

The Lunkenheimer Co., Cincinnati, O., has just issued a little catalogue of its generator valves. The booklet is quite small, but it nevertheless enters thoroughly into a description of the various types of generator valves manufactured by the company. The booklet is illustrated with wash drawings and a complete price list is given. The booklet will be sent to anyone interested.

### IMPROVING HARBOR AT BUFFALO, N. Y.

Abstract of proposals for excavation in south end of Buffalo Harbor, N. Y., received in response to advertisement of May 1 and opened June 1, 1907, at Buffalo, N. Y., by H. M. Adams, Colonel, Corps of Engineers.

No.	Name and address—	Dredging and removing 100,000 yards of material. Total		Remarks.
		Per cubic yard, scow measure.		
1	Daly & Hannan Dredging Co., Ogdensburg, N. Y.	28 c	\$28,000.00	
2	Graves & Stephens, Cleveland, O.	20 c	20,000.00	
3	Buffalo Dredging Co., Buffalo, N. Y.	14 c	14,000.00	Accepted.
4	Lake Erie Dredging Co., Buffalo, N. Y.	23½ c	23,500.00	
5	Great Lakes Dredge & Dock Co., Chicago, Ill.	24½ c	24,500.00	

### IMPROVING HARBOR AT BUFFALO, N. Y.

Abstract of proposals for removing shoals outside north end of breakwater at Buffalo, N. Y., received in response to advertisement dated May 3, and opened June 3, 1907, at Buffalo, N. Y., by H. M. Adams, Colonel, Corps of Engineers.

No.	Name and address—	Removing 35,000 cubic yards material per cubic yard, scow measure. Total		Remarks.
1	Lake Erie Dredging Co., Buffalo, N. Y.	\$1.74	\$ 60,900.00	Accepted.
2	Graves & Stephens, Cleveland, O.	5.50	192,500.00	
3	Great Lakes Dredge & Dock Co., Chicago, Ill.	5.25	183,750.00	
4	Buffalo Dredging Co., Buffalo, N. Y.	3.80	133,000.00	

### REMOVING RIP-RAP AT ASHLAND, WIS.

Abstract of bids opened June 6, 1907, at Duluth, Minn., by Major Graham D. Fitch, Corps of Engineers, for furnishing and placing about 60,000 tons of rip-rap at Ashland, Wis. Amount available for this work, about \$80,000. Amount proposed to be expended, about \$60,000.

No. of bid.	Name and address of bidder.	Per ton of 2,000 lbs., including removal of cross ties and drift-wood. Total.		Remarks.
1	Alex. Sang, Duluth, Minn.	\$0.99	\$59,400	*Recommended for acceptance on account superior quality of stone.
2	A. Donald & Co., Ashland, Wis.	1.07	64,200	
3	Powell & Mitchell, Marquette, Mich.	1.25	75,000	
4	Northern Dredge Co., Duluth, Minn.	.97	58,200	Stone unsatisfactory.

## SCIENTIFIC LAKE NAVIGATION.

BY CLARENCE E. LONG.

The regular course protractor is graduated from zero to 90 degrees at the middle line, and when using it in the manner indicated, the course is in each case to be reckoned from north or south towards east or west, as the case may be. The regular course protractor is probably more serviceable than this. This consists of a circle of isinglass or celluloid, having its circular edge graduated into degrees and points, and a long thread leading from the center of the instrument. The course is obtained the same as has already been explained. In last issue is another transparent course protractor, and the directions for using it are as follows: Place the open center of the protractor over the position of the ship on the chart, then set the protractor true by the parallel lines around its edges, cutting or running parallel to some meridian on the chart. With the silk cord draw a north line, then keeping the card drawn to the north, with the other hand turn the protractor (keeping it central over position) to the right or left for Ely. or Wly. Var., if any. Now stretch the cord to any point, and the reading on the protractor where the cord passes over it will give the correct magnetic course.

## PATENTED DEVICES.

There are a number of other devices and contrivances for taking off courses and bearings from the chart. One of these patented arrangements has adjusted to one of the rulers a dumb-compass, and attached to the compass and other ruler are two metal arms so that when the second ruler is set it is in parallel conjunction with the compass, that is, the compass moves or swings with this ruler. A hand or indicator moves over the face of the compass, and is attached to the first ruler. Thus, to get the course lay the first ruler over the points of departure and destination. The second ruler is placed to a near-by meridian or to a parallel of latitude, and this sets the dumb-compass in coincidence with the chart, that is, the dumb-compass points in precisely the same manner as do the diagram compasses on the chart. The first ruler controls the hand which indicates the course. These instruments all work on the principle of the parallel ruler, only that they have the advantage of giving the course at once without any climbing and sliding of rulers.

Others again work on the principle of the protractor bearing a radial arm. The simplest instrument is by all

means the best instrument, so long as it answers every purpose; and it may be said in passing, that the old-time parallel ruler is able to perform any and all the feats and wonders claimed for its more pretentious neighbors. And too, it has the advantage of being cheaper in price.

## THE COURSE ON DIFFERENT CHARTS.

As is to be explained, the course between any two places on a Mercator's chart is the angle which a straight line connecting them makes with the meridian. On a Mercator's chart, where the meridians and parallels are all straight lines and at right angles to each other, any one of these patent arrangements gives very satisfactory and accurate results. On a polyconic chart (charts of the Lake Survey Office) the parallel ruler gives a more accurate course than any other instrument used for that purpose. By the use of the parallel ruler the course can be taken from the compass rose lying midway, or near to it, between the points of departure and destination, when the route is a long one. For it must be apparent that on a chart where the meridians and parallels are slightly curved the compass diagrams laid down accordingly cannot be precisely the same everywhere on the chart.

The dividers (compasses) is an instrument consisting of two legs pointed and jointed at the top by a pivoted joint, used by navigators for measuring distances on a chart, pricking off positions, etc. Dividers should be of good quality. The points must be fine, and formed of well tempered steel that cannot be bent or blunted. Above all, the joint should be good, for if not, it will be provokingly difficult to set the legs to any required distance, on account of the spring and want of uniformity in their motion. A pair of dividers with an indifferent joint, when being opened or closed, will move by fits and starts, and either go beyond the measurement required or stop short of it. The joint should also be stiff enough in its action to hold the legs in any required position without fear of alteration when handled with ordinary care. These are the things to be tested when making a purchase. Instrument cases always contain a key for tightening up the joints of the dividers when they work slack. What are known as hair dividers give very exact measurements, but for navigating purposes they are too good, and too costly. When a ship is rolling violently, and it becomes necessary to consult a chart every seaman is aware of the difficulty experienced in keeping the chart and ruler on the table with

one hand, whilst with the other he is trying to manipulate the dividers. Some clever fellow, who has evidently been pretty often in this fix, has invented a pair of dividers for use with one hand, which are worthy of coming into general use. They are opened by a pressure of the palm of the hand on the circular part, which causes the legs to overlap each other and the points to separate. They work just opposite to those of the ordinary dividers.

## NON-REVERSE COURSES AGAIN.

Editor MARINE REVIEW:—Replying to "Eryas" on "Non-Reverse Courses" and navigation in general: Eryas says that to adopt an outside course would increase rather than lessen the chances of collision and also would increase the chances of stranding and loss by storm. This I suppose is on the supposition that boats could be overtaken by storm before having a chance to make a lee, and also from stranding on account of the outside course being so far from the land that the reckoning would be lost in again making the land. Now, the Lake Carriers' Auxiliary Committee on Aids to Navigation, who were first to propose the adoption of separate courses, stated specifically that "Weather conditions, of course, to be taken into consideration at all times by the master." Therefore, the argument used by Eryas in regard to stormy weather and the management of a ship at such a time, counts for naught. If all boats were to follow such a course regardless of weather conditions, then there would be some reason for such an argument.

Eryas further says "The letters published in the issue of May 16 are a credit to the writers and in the opinion of those practically conversant with the subject, established without a doubt the inconsistency of the rule." I agree with Eryas, the letters are very good. But Eryas refers to the letters in a manner to further his own argument, and would like to convey the idea that they are all of the same opinion, which opinion is coincident with his. There were fourteen masters who wrote the letters referred to. Now, if some of them are in favor of the plan and some not they cannot all be for it and they cannot all be right or all wrong. I quote from these letters more because Eryas says "They are men who are practically conversant with the subject;" in other words, I will use his own argument. I will enumerate these masters by numbers, from 1 to 14 in the order that their letters were published, and at the same time state briefly their opinions and their reasons for same: No. 1 bases his argument on the

storm theory, but concludes his letter by saying: "Were the waters of the lakes never affected by storms it would seem to me that the new plan would then be the correct thing." Master No. 1 then is in favor of the plan, because it has all along been understood that the weather conditions must be taken into account in making these courses. If the master used his own judgment in regard to weather in following these courses, it would amount to practically the same thing as the statement "that if the waters of the lakes were never affected by storm."

Master No. 2 objects to it on account of the courses crossing one another too much. He does not intimate, however, that the courses could not be made or that they would lead to stranding in case they were adopted.

Master No. 3 bases his argument on the weather conditions, and also on account of not sufficient sea room, which is very true.

Master No. 4 favors the plan. He puts up an argument that no man can get away from. He states nothing but facts and tells a long story in a few words. This man knows what he is talking about. There are many masters who know that what he says is so but you could not get them to admit it.

No. 5 objects to the plan on account of weather conditions. He makes this statement: "Lake pilots seem to be always 'coast pilots' and do a great part of their piloting by land marks and should correct their position by every land mark they see." This statement hardly agrees with what Eryas says in regard to lake men being navigators as good as can be produced in the world. A real navigator does not have to depend wholly on land marks to make his courses. I am glad that it was Master No. 5 that made the statement rather than the writer heretofore. It must be true because it comes from a man who is "practically conversant with the subject."

No. 6 makes a very good argument. He says, "If these courses could be followed with a reasonable degree of safety at the turning points, I entertain no doubt it would be an improvement." He endorses the outside course on Lake Huron. He must then be of the opinion that there would not be the difficulty that Eryas claims in making this course. If a two-course system is practical on Lake Huron why not on Lake Superior? If this be a fact, and No. 6 does not intimate anything to the contrary, his opinion differs very much from the argument employed by Eryas.

No. 7 objects to it on account of the weather conditions, and that he would be unable to see the lights and hear

the fog signals, virtually admitting that without these aids he could not make the courses.

No. 8 uses good reasoning in his argument in saying that the courses cannot be separated far enough to eliminate the chances of collision on account of so many of the courses being so nearly parallel with one another.

No. 9 is in favor of the new plan if all boats would adhere to it. Judging from No. 9's letter he isn't a "land mark navigator" at any rate.

No. 10 favors the plan and uses a telling argument. He not only knows what he is talking about, but he fully understands the promoter's ideas in recommending the plan. He says: "After duly considering the same I am of the opinion that the theory advanced has much in its favor, as a general rule of navigation in foggy and ordinary weather, and in my estimation should be adopted and complied with so far as possible. It meets with my hearty approval."

No. 11 is not in favor of it on account of being out too far, not being able to get the lights and fog signals.

No. 12 objects on the grounds that the courses cross one another at the important turning points.

No. 13 disfavours it on the ground that the courses cross each other.

No. 14 favors the idea, and says that he has, on several occasions, in thick weather, steered an outside course in order to avoid meeting so many boats.

Surely the foregoing communications do not illustrate the "inconsistency of the plan." It is one thing to make a statement, but another thing to back it up.

Now, in relation to Eryas' remarks on leeway or side drifts: Is it not just as much a master's duty to be able to allow for leeway or side drift, send of the sea, head wind, following wind and sea, etc., as it is to be able to correct his course for variation and deviation? Is it not a fact that when all these corrections have been properly made that the ship is making good her course. Is it not a master's duty to know his own boat, how much drift she will make under certain conditions of wind and weather and how much to hold her up to counteract such an effect? I fully realize that these allowances cannot always be made to the degree of accuracy, but a man with good judgment, and especially if he has sailed all his life time, should come sufficiently near to it, that he would not be far enough off his course to invite the chances of stranding. The courses can be controlled by other means than those mentioned by Eryas.

At the time the Lake Carriers' com-

mittee of captains proposed the idea of an outside course it was pointed out by certain masters (and ones practically conversant with the subject) and boat managers that their courses did not cover the plan to be sought. The idea was correct, but the trouble was that their courses ran too much parallel with other courses. To overcome this defect in the original plan a two-course system was suggested for these two lakes. The suggestion was made by several prominent vessel managers and masters, who favored the idea, if such a plan were to be carried out for the purpose of the prevention of collision. It was then that I was asked to write as much in favor of the plan as was consistent with the conditions to be encountered. I did this. The idea was not wholly original with me. It came from men who are in the "harness." There is not much that is really original about the plan, because many of the larger vessels are, and have been, making use of an outside course on these lakes to avoid meeting so many boats. On Lake Huron a two-system course is made of it. In order to make but two courses of it you cannot bring your single turning point any closer to the land than what has already been recommended. If a two-system course were to be adopted I favored the outside course for east bound boats on Lake Superior for east bound boats have not the means of verifying their courses in cloudy or foul weather, while west bound boats can use the Soo River ranges to the very best advantage. Therefore, it is easier for a boat to make courses in cloudy weather bound west than when bound east, from Duluth or Two Harbors. If azimuths were always available it would then make no difference. Now, with compass deviations continually changing and no actual way of determining them in cloudy weather, is it good judgment or poor judgment to suggest a course having plenty of sea room on both sides, or one that has the sea room only on the one side? In other words, in foggy weather, when you are not just sure of your course, is it good or poor judgment to follow an outside course in preference to an inside or shore course? Is it good judgment or poor judgment in saying that a boat has the means at her disposal for making better courses bound west on Lake Superior than bound east? If you can depend more on your courses going west than going east, is it wise or unwise to propose an inside course (the present shore course) to an outside course? Which is the more safe to

follow, a shore course in thick weather, or an outside course?

I would like to ask: What is to hinder the larger class of tonnage from adopting an outside course? Would it not help to lessen the chances of collision if a certain amount of tonnage was taken off the usual track of steamers? It seems to me that it should lessen the chances rather than to increase them, notwithstanding all the argument that has been brought against it. Conditions could not be any worse than they are so far as steering courses promiscuously, and if boats are able to meet and pass each other as well as they do, could they not do so to a better advantage if there were less boats to meet than now? I cannot see where any harm could come from it even if no good. So far as getting all classes of tonnage to follow these courses will never work for the many reasons already advanced, but this should in no way interfere with the tonnage that can make use of it. Before a plan of this kind will prove successful all boats will have to be put in the same class navigationally. This would require all boats to be provided with the instruments necessary for navigating a vessel successfully, and not only this, every boat's officers must understand the handling of these instruments. Were this a fact but little objection would be made to the plan of non-reverse courses, outside of the weather conditions.

There are many who are always ready to throw cold water on anything that is new. New things usually have to be given a trial before their practicability or impracticability can be determined. It was the same thing with the azimuth when it was first introduced on the lakes. There was all kinds of objection to it, and the ones that made the most noise about it were the ones that were least capable of judging.

The mere fact that we have not the sea room on the lakes as on the ocean, and that courses run parallel and cross one another, should not stand in the way for giving non-reverse courses a fair trial. We must do the best we can with what nature has provided. Many have the idea that the success of this plan depends solely on making the turning points right to the dot. This is not so and is very far from it. How do you make your turns now? Are you always where you figure you are going to be, or ought to be? No. Well, if you could do as well with the outside course and turning points as you now do with the inside course and turn-

ing points, would you not be as well off? The fact of the matter is, on the outside course you would have more sea room for any error of this kind.

Eryas says that "masters and mates study the principles of navigation and apply them as far as the conditions will admit." There is not more, if there is, 50 per cent of the boats on the lakes that are equipped with the instruments necessary for making courses. They are not even provided with the ordinary bearing indicator. A bearing taken without the aid of an instrument is about as much account as a good "guess." The question then is, how far will the "conditions admit." If vessels are not provided with the necessary instruments for carrying out the safety methods of navigation, the men on board certainly cannot practice these methods; therefore, they are not "perfectly familiar with the bearing indicator and cannot make use of it at every available point" as Eryas claims. If these things are necessary on one boat, why are they not on another? Boats that are not provided with these instruments have not the opportunity of making as good courses as those that are provided.

Eryas says that the lake seaman becomes a navigator under the most favorable environments for learning practical methods and self-reliance. What are these most favorable environments? Is every boat a navigation school? They become good pilots and not navigators; that is, if navigator is taken literally instead of figuratively. When they become practical navigators they have first studied the theory of navigation. The theory of navigation is learned from books, and one might as well expect to learn to read and write on the deck of a vessel as to obtain a correct theory of navigation on board. Pure navigation is not learned on the deck of a boat. The theory of a science must first be learned and understood before it can be practically applied. The doctor and the lawyer study the theory of their profession before they practice it.

With an azimuth for setting the course, and an efficient compass and log, the latter checked by both the speed of the ship and the number of turns of the propeller to the measured mile, with the proper allowance made for leeway, head wind or head sea, etc., it becomes as easy a matter to steer a course to a point 29 miles from Passage Island as it would to a point 12 miles off Eagle Harbor, or a less distance. The direction of Duluth piers affords a ready means of establishing the first course of the two outside courses proposed on Lake

Superior, and by the time Devil's Island is passed a bearing or two ought to establish whether the course then being steered is the right one. If there is a wind causing leeway or sideway drift, or a head wind and sea that is stopping the ship's speed, or a following wind and sea, that is increasing her speed, these allowances can be applied so that the ship is making a course that is practically the correct thing. As a usual thing there is not much wind and sea with a fog. It is practically the same distance from Devil's Island to Eagle Harbor on the inside course as it is from Devil's Island to the turning point 29 miles from Passage Island, but from this turning point to Caribou Island it is not so far as it is from Eagle Harbor to Whitefish Point. Caribou Island affords a ready means of verifying the course to Whitefish Point. Getting a departure from Caribou Island one should not have a great deal of trouble in making Whitefish Point at any specified distance from it. Caribou Island affords a better departure for the east end of Lake Superior than Devil's Island does for the west end. Eryas is probably afraid that he might hit Caribou Island on this outside course. If Caribou Island is to be passed at a distance of 10 miles, there is certainly room enough for small errors in the course. To make Whitefish Point at a distance of six miles off, the vessel's position should be verified at Caribou. This should always be done. The master must have such control of his course and distance that he can verify his position at Caribou under almost any conditions. Even if it is necessary to stop and sound it should be done. Precautionary measures must always be taken before a ship's time is run out, and the courses steered thereafter; that is, in the case of foggy weather and you are trying to pick up the whistle, should be on the safe side.

The statement of Eryas in regard to the change of compass error is rather vague. The standard compass, as a usual thing, is so far away from the hold of the ship that the iron ore cargo has but little effect on it. The cargo would have to be unusually strong magnetically. The steering compass is more susceptible on account of it being so much closer. There is this much about it, the same effect that would change the deviation of the steering compass would not influence the standard compass, so that any such effect could be readily detected as soon as it took place. If the course is first carefully set by the standard compass and compared by

the steering compass, then any change that is more susceptible to the steering compass than the standard compass must be readily detected by the latter. The standard compass being less liable to these changes should be the one to go by, and the course again must be re-set by the standard compass. The standard compass should always be used for setting the course, and the watch officer should pay as much attention to it as the wheelsman does to the steering compass. Not enough attention is paid to such matters. By carefully observing the standard compass one can tell whether the steering is being properly done, or if the wheelsman is letting her work all one way, etc. Much more might be said about this subject, but I have neither the time nor space in this issue.

LONG.

### QUESTIONS FOR WHEELSMEN AND WATCHMEN.

#### SIXTH INSTALLMENT.

61. What is meant by right of way?
62. Within the meaning of the rules, what is a steam vessel?
63. Does a gasoline vessel, when under such power, come within the meaning of a steam vessel as described by the rules?
64. What is a sailing vessel?
65. What is a tow barge?
66. What is the difference in the lights used in the night time on a sailing vessel and a tow barge?
67. What is the port side of a vessel?
68. Walking aft from forward, which is the port side and which is the starboard side of your vessel?
69. Which is the weather side of a vessel?
70. Is the weather side of a ship the port or the starboard side?
71. Why is it that steam vessels must give way to sailing vessels?
72. What is meant by "underway"?

### ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

#### THIRD INSTALLMENT, PUBLISHED JUNE 6.

25. The government law regulating the meeting and passing in safety of both steam and sailing ships under every circumstance and condition, hence the prevention of collision at sea. Consult the introductory portion of the "Pilot Rules of the Great Lakes," also "Rules of the Road for the Great Lakes, known as the White Law."

26. By writing to the department of commerce and labor, Washington, D. C., or applying in person to any of the local inspectors of steam vessels. Send-

ing direct to Washington is the better way.

27. Steamers meeting "head and head" or nearly so. Consult Rule I.

28. When two boats are approaching each other from reverse or nearly reverse directions; so that by a continuation of their courses would lead to collision. Consult Rule I for this information.

29. By being able to see both of the colored lights on each boat at the same time; that is, the pilot of one boat sees both colored lights of the other boat at the same time, and vice versa, the other pilot sees the same on the other boat. Rule I relates to this condition.

30. By the appearance and position of their hulls in the water; coming lengthwise instead of crosswise; the ranging of the masts; being only able to see the bows or forward portion of a boat. This question comes under Rule I.

31. The one and two blasts of the big whistle. One blast meaning to port helm and two blasts to starboard the helm. Consult Rules I, II, V, VI, 17, 18, and 23; also consult the boat diagrams for the rules of the road.

32. One blast meaning that I am directing my course to starboard (by putting my helm to port), and two blasts meaning that I am directing my course to port (by putting my helm to starboard). See rule 23.

33. To port the helm and swing the boat's bow to starboard. The helm must go to port regardless of how the steering wheel must be rolled in order to execute it. You must know your gear. Remember that with a cross gear the steering wheel and helm move the same way, but with a straight gear they move in opposite directions.

34. That I am directing my course, or he is directing his course, to starboard, by porting the helm. Consult Rule 23.

35. When the course of one boat crosses the course of another boat they are said to be "crossing vessels." Consult Rule II and diagrams of the Fourth and Fifth Situations, also Sixth and Seventh Situations.

36. On the starboard or right side looking forward. Green light and starboard helm are similar. To show your green light you must starboard (your helm), and similarly, to show your red light you must port (your helm).

### QUESTIONS AND ANSWERS.

*Ques.*—What is leeway, and how would you find it? *Ans.*—Leeway is the sideways drift of a vessel caused by the wind and sea striking her side.

To determine the leeway note the line of the ship's keel by observing the course by compass, then see what angle the wake makes with this, and that will be the leeway. For example, a ship is steering NE with the wind about NW; now the heel of her keel is SW, and if the wake now bore SW  $\frac{1}{2}$  W by compass, consequently it makes an angle of one-half point with the line of the keel, and that is the amount of leeway being made. If a patent log is being towed from the taff rail, the angle made by the line with the keel will give the amount of leeway. If the vessel is not towing a log, then the hand-lead may be temporarily thrown overboard and allowed to trail astern, and the angle measured by it. When the vessel is making no leeway, that fact is established by the wake making no angle with the line of the keel; but if leeway is being made, the wake will trend on the weather quarter. Some vessels have a graduated half circle of brass screwed on the middle of the taff rail, and when it is desired to ascertain the amount of leeway, the bight of the log line is carried to this half circle and held in the center of same, then the trending of the line will give the amount of leeway according to the point on the circle that the line is over.

*Ques.*—It bothers me to tell which name the deviation takes when on a known range or going out of a pier. I call easterly westerly and westerly easterly in naming the deviation. It is simple, I know, but at the same time it is confusing. *Ans.*—The deviation is named according to the way the card is turned or the way the needle is drawn, both of which amount to the same thing, since it is the needle that carries the card and responsible for moving it. The deviation is easterly when the card has turned to the right or towards the right, and westerly when turned to the left. The deviation is always the difference between the correct magnetic bearing of the range and the compass bearing of the range; that is, whatever your compass says, with ship's head on the range the difference between it and what you know the correct magnetic bearing to be is the deviation for that correct magnetic point of the compass that the range is equal to. Now, to name the deviation. Since the deviation is the attraction of the compass needle to the right or to the left by the ship's magnetism it is convenient to imagine the compass to read the same as the correct magnetic bearing of the range and then to imagine the deviation to

draw the card aside to the compass course shown when the ship is on the range. The direction the card has to turn in to go from the correct magnetic bearing to the compass bearing establishes the name of the deviation at once. An example will better explain it: Supposing the correct magnetic bearing of a range to be SE  $\frac{1}{2}$  E and with the ship's head on this range the compass reads SE  $\frac{1}{4}$  S. To name the deviation: Just imagine now that the compass reads the same thing as the correct magnetic bearing of the range, that is, SE  $\frac{1}{2}$  E, and as you are looking at it the deviation in the boat draws the compass needle to SE  $\frac{1}{4}$  S, or in other words, how must the card turn to bring SE  $\frac{1}{4}$  S where SE  $\frac{1}{2}$  E ought to be. The card has turned to the left, hence the deviation is Wly. Where your trouble is and the same with all beginners, you do the moving on the card forgetting while doing so that it is the card that does the moving and that it has already moved. It has moved because the attraction causing the deviation has moved it. There could be no deviation unless the card has moved from its correct magnetic directions. If you will bear the rules in mind you cannot make a mistake, because the rules always remain the same, even though you can change them about in your own mind. The rule for naming the deviation is: If the correct magnetic bearing is to the right of the compass bearing, the deviation is easterly, and when to the left, westerly. It can also be reasoned and proved thus: From a correct magnetic course to a compass course allow Ely. Dev. to the left of the correct magnetic course, and to the right for Wly. Dev. From a compass course to a correct magnetic course allow Ely. Dev. to the right of the compass course and Wly. to the left. Let us prove this by the above example: The Dev. is  $\frac{3}{4}$ -pt. Wly.  $\frac{3}{4}$ -pt. to the right of correct magnetic course SE $\frac{1}{2}$ E gives compass course SE $\frac{1}{4}$ S. Compass course SE $\frac{1}{4}$ S with  $\frac{3}{4}$ -pt. Wly. Dev. allowed to the left gives correct magnetic course SE $\frac{1}{2}$ E.

*Ques.*—What are the essentials of an efficient compass? *Ans.*—It is essential that the card should have the greatest possible magnetic power in its needles, combined with the smallest possible weight in the whole card. The jewel cap should be sound—that is, not worn or cracked, and the pivot sharp and free from rust. If the card is placed on the pivot and deflected through a small angle from its position of rest, it should always come back exactly to the same point. The card should be accurately divided and centered, and the point of the pivot should be in the same plane as the gimbals of the bowl. The lubber

mark should be accurately placed on the bowl, that is, its division should be made truly. When a compass is placed on board ship, the lubber line should be vertical and exactly in the fore-and-aft line from the center of the card, and the bowl should swing freely in its gimbals. The bowl must swing freely or the lubber mark will not be truly vertical when the ship rolls or is off an even beam. All compass bowls should be made of pure copper.

*Ques.*—Why do many of the standard works of navigation refer to the variation and deviation of the compass as compass errors, or as the total error of the compass? *Ans.*—Variation and deviation are not errors of the compass; they are corrections. An error of the compass is some fault of the compass, such as weak needles, the needles not being attached parallel to north and south on the card, etc., while variation is due to a law of nature, and therefore is a natural consequence of the phenomena responsible for it. Variation is due to the fact that nature placed her magnetic poles, to which all compass needles direct themselves, at some distance from her true poles. If the magnetic poles were at the true poles, which is equal to saying, that if the compass pointed to the true poles of the earth, there would be no such thing as variation of the compass. The true poles are at the ends of the earth's axis on which it rotates. These points are the ends of the earth, and are the starting points for direction, since all the meridians of longitude come together and meet at these points, which theoretically, are mere dots. If the compass needle pointed to the true poles of the earth it would direct itself in the same manner as the meridians do. Unfortunately this is not the case, but we make it answer the same purpose by referring all directions to the true meridian and by applying the angle between the direction of the compass needle as it points to the magnetic pole at any place. While the direction on the compass card is not the same as that of the true direction the point coincident with it answers the purpose of same. This is called the variation of the compass, and is just what any navigator would expect of this instrument. If the compass did not show the same variation as recorded for the place of observation, or showed a different amount on different observations, then the variation would be in error due to an error of the compass. Variation of the compass is a correction of the compass, because it is a known quantity that must be supplied to the indications of that instrument in order to make it agree with the direction of the standard line of reference, the meridian. The meridian is fixed while the correction

(variation) varies for different localities. What has been said of variation is likewise true about deviation. While deviation of the compass is due to an entire different cause than that of variation, nevertheless its laws are similar.

*Ques.*—What are some of the causes which operate to change the deviation of the compass? *Ans.*—Loss or gain of magnetism in the compass needles (usually a loss); change in the magnetic force in the iron or steel near the compass; the cargo, when of iron or steel, or other magnetic substance. When an iron or steel steamer makes a number of trips without cargo the vibration caused by her engines and the revolutions of her screw will somewhat change the magnetism of the hull. Another change is due to "retentive" magnetism, from induction, such as when a vessel's head has been in one direction for a long time, or on a long course. Shocks and strains of all kinds, such as laboring in a heavy sea, especially in "bucking" into it and the vessel pounds, has an effect in either increasing or decreasing the magnetism of the hull. The shocks of loading iron ore through chutes from high pockets must also have an effect on the vessel's magnetism, especially when often repeated, as is the case with steamers in the ore trade. Heat and cold play an important part in changing the deviation. Another important change in the deviation is when a vessel is loaded or in light trim, the difference being due to the change in direction of the lines of magnetic force of the ship's magnetism in relation to the compass needle. When the ship is loaded she is near to an even keel, but when flying light her bow is high in the air. While the ship may have the same amount of magnetism in either case, the magnetic force changes its lines of direction on the compass needle, so that the compass cannot be under the same influences at both times. This is one of the greatest difficulties that the lake master has to contend with in the use of the compass. The difference in the readings of the same compass between when loaded or light, frequently amounts to a point, and many times more than a point. There are so many causes which operate to change the vessel's magnetism and deviation, that it is absolutely necessary to check all courses steered or to be steered by frequent azimuths, and also by river and harbor ranges. When these are lacking the master has to do some "tall" guessing.

*Ques.*—What is the advantage in a deviation curve? Is not a table of deviation just as advantageous? *Ans.*—Its chief merit is that the deviation may be determined for a few points, and a symmetrical curve traced through them will give a graphical illustration of the de-

viation for each point and fractional point of the compass. For a table of deviation you must determine the deviation by observation on every point of the compass you desire.

*Ques.*—After a compass has been adjusted, is it not correct, and does it not remain correct? *Ans.*—With some of the masters and pilots on the lakes the impression prevails that after a compass has been adjusted it is, or should be, correct. This is true in only a very few cases and then but for a limited time; it requires only a short interval of time, vibrations, shocks or strains, to change the magnetic force in the hull so as to make the compass point incorrectly. Owing to the fact that the pieces of iron, or masses of iron, causing the deviation are not distributed symmetrically around the compass causes an unequal disturbing force which the correcting magnets cannot wipe out entirely. The correcting magnets counteract the symmetrical portion of this deviation and that is all. The unsymmetrical portion must be ascertained by observation and recorded. It is called residual deviation—that remaining or left over. It is as necessary to swing a vessel for a deviation table or curve after the compass has been adjusted as it would be if the compass was not adjusted. It is safe to assume that after a compass has been adjusted it will not remain correct for any length of time, and though the correction be small the navigator should know how much it is that he may allow for it in setting his courses.

### THE NAUTICAL TERM TACK.

Definitions that will be helpful in understanding the question course now running in the REVIEW for the benefit of wheelmen and watchmen and others who are interested. Study this over carefully till you thoroughly understand it. It will help you to better understand the questions and answers that are to follow in this particular course.

The nautical term *tack* has many phases and many meanings on board ship.

*To Tack Ship*, means to come about, or to go about, or to come in stays. If the vessel had been on the port tack (wind on port side), and her helm and sails changed to bring the wind on the starboard side, she would be brought up in the wind's eye (starboard helm) and by it, until the wind filled the sails on the opposite side.

The *Tack of Sail* is the extreme lower forward corner of any sail.

The *Tack Line*, or *Tack Pennant*, of a fore-and-aft sail is the rope that keeps down the tack of the sail, that is, the lower forward corner; also the

rope that keeps down the lower outer corner of a studding sail.

The tack of a gaff-topsail is the V-shaped lower forward corner of the sail, to which is fastened the tack line or tack pennant, one of which leads to the deck on either side of the gaff, and is used for trimming and keeping down this portion of the sail. For instance, the vessel has been on the starboard tack, and is coming in stays to go off on the port tack. The tack line, which has been hauled taut and fastened on the starboard (windward) side, is now let go of, and hauled taut on the port side (now the windward side), that is, the lower corner of the sail is pulled up and over the gaff, near the jaw, and hauled taut. This gives the proper trim and shape to the sail.

The sailing vessel is on the starboard tack when the wind comes over the starboard side and the sails fill out to port; and on the port tack when the wind comes over the port side and the sails fill out to starboard.

The tacks are changed from one side to the other when the vessel is thrown up into the wind (coming in stays, or tacking ship). The tack of the sail or-tack line, is always pulled taut on the windward side, and the same side the tack is on is likewise the tack the ship is on. It was from this circumstance that the starboard and port tacks were so named. When the tack is pulled taut on the starboard side the vessel is said to be on the starboard tack; hence, the tack the vessel is on is governed by the tack line to windward. If the windward side is the starboard side then the ship is on the starboard, but when the windward side is the port side of the ship then the tack the ship is on is the port tack. If you will always remember this you will never have any difficulty in understanding the principle of it.

This starboard and port tack question is not only a puzzler to the layman and young sailor alike, but to many practical men as well. Knowing the meaning of starboard and port (right and left) it is only natural that one should think that a vessel is on the starboard tack when her sails fill and belly out to starboard; and vice versa, for the port tack, but as you have seen, these terms did not originate from such a condition. They are just the reverse of the way one would most naturally think they ought to be. The port and starboard tack proposition is a very important factor in the rules of the road.

A schooner closehauled (beating to windward) will lie all the way from  $4\frac{1}{2}$  to 6 points from the wind, the average being about  $5\frac{1}{2}$  points. Know-

ing how close a vessel will head from the wind the direction of the wind can readily be found by counting the number of points from her compass course—counting from her compass course toward the right on the starboard tack and toward the left on the port tack.

*Example*—Let us assume that a vessel lies  $5\frac{1}{2}$  points from the wind, she is heading SE x S on the starboard tack; the wind is then about SSW  $\frac{1}{2}$  W (SW x S  $\frac{1}{2}$  S) or  $5\frac{1}{2}$  points to the right of the compass course. If on the port tack heading SE x S the wind would be about E  $\frac{1}{2}$  N, or  $5\frac{1}{2}$  points to the left of the compass course. Again, if you did not know how close your vessel lies to the wind and wished to find out, note the reading of the compass when on either tack closehauled, and again when she comes in stays (when she comes up in the wind's eye—comes about and changes tacks). This will work all right provided the compass is a steady one and the vessel's head is not swung too rapidly; otherwise the compass card will have a swinging motion and will not show the same reading it would where the ship's head was steadied for some little time. The better way is to note the compass course on each tack and half way between the two should give the direction of the wind. This, of course, is on the assumption that there is no deviation of the compass. In practice if you get within a point of it is sufficiently close.

A sailing vessel is said to be closehauled when she endeavors to progress in the nearest direction possible to the wind. The wind in this case will be somewhere forward of abeam, on either side.

A vessel is running free, or "before the wind" or "off the wind," when the wind is anywhere abaft the beam on either side.

Sailing closehauled is the same thing as "on a taut bowline," "on the wind" and "by the wind."

*Beating.* To make progress against the direction of the wind by tacking in a zig-zag line or traverse. A vessel is said to be beating to windward when running closehauled.

*Beating to Windward.* Tacking and getting to windward from place of starting; that is, making progress against the direction of the wind; sailing closehauled.

*By the Wind.* When a ship is as near to the wind as her head can lie with the sails filled.

*To Tack.* To turn a ship by the sails and the rudder against the wind.

You should now be able to answer at once such questions as follow:

If a vessel holds up 5 points from

the wind closehailed, and the wind is NE, how will she head on the starboard tack? About how would she head when she comes in stays to go off closehailed on the port tack? Answer. N x W on the starboard tack, and E x S on the port tack.

If the wind is S x E and a vessel heads ESE, is the wind forward or abaft the beam? Answer. Forward of abeam, or forward of the beam.

What tack is this fellow on? Ans. Starboard tack.

If a vessel heads SSE with the wind NW, is the wind forward or abaft the beam. Ans. Abaft the beam.

A square-rigged vessel closehailed will lie about 6 points from the wind, and a sloop-rigged vessel closehailed will lie from 3 to 4 points from the wind,  $3\frac{1}{2}$  points being about the average; all depending upon the sails, whether new or old, trim of the vessel, whether light or loaded, etc.

(To be continued.)

#### OBITUARY.

The British ship building trade has lost its most famous representative by the death of Sir Charles Mark Palmer, Bart, M. P., for the Jarrow division of Durham. Sir Charles had attained the great age of 85. It was on his initiative that the ship building trade has been almost revolutionized. At the Jarrow works, which he founded, the ore is smelted at one end, and appears on the finished vessel at the other. At this establishment the first steam collier was built, which revolutionized the coal trade of the time, and sealed the doom of the sailing brigs. The establishment of their ship building works in 1852 founded the town of Jarrow, and on the initiative of Mr. Palmer blast furnaces and rolling mills were added. The firm were among the first to work the Cleveland ironstone, and they ran a fleet of steamers for its removal. The harbor at Port Mulgrave cost the firm £50,000, and was provided solely for the shipment of ironstone. When the concern became a limited company in 1866 Sir Charles Palmer became its chairman. A remarkable number of big war vessels were turned out, in addition to vessels for the mercantile marine. Sir Charles, notwithstanding his business activity, found time to take keen interest in the social, municipal, and political life of Jarrow, and his death has created a Parliamentary vacancy, the deceased baronet having been its Liberal representative continuously since 1885.

#### ITEMS OF GENERAL INTEREST.

The lake steamer Ravenscraig, which has been purchased by the Eastern Coal Co., of Providence, R. I., will be extensively altered at New York, the alterations amounting in value to about \$40,000.

The White Star line has recently published its list of sailings to the Mediterranean for January and February, 1908. The Cedric, Canopic, Republic and Romanic are scheduled to sail in this service.

The executive committee of the board of supervising inspection service has approved the Randle patent boat disengaging apparatus, presented by the New York Ship Building Co., at Camden, N. J., and the Semple & Ward disengaging apparatus presented by Capt. Allen Luckhurst, International Navigation Co., New York.

The Implacable, of the British navy, broke the world's coal record at Malta recently, taking on board 1,050 tons of coal in two hours and forty minutes, being an average of 394 tons per hour. No shore labor was engaged, and only baskets were used. The record was previously held by H. M. Cruiser Black Prince with 316 tons per hour.

At a special meeting of the directors of the Joseph Dixon Crucible Co., held May 31, to take action on the death of vice president and treasurer John A. Walker, Geo. T. Smith was elected vice president, Geo. E. Long treasurer, and Harry Dailey was elected director and secretary.

It is announced that Tongo Maru is the name selected for the first of the three steamers that are now building at the Mitsu Bishi ship yard at Nagasaki for the Toyo Kisen Kaisha. The Tongo Maru is 575 ft. long, 63 ft. beam and 39 ft. deep. She will be an oil burner and will be equipped with turbines.

The Steamboat Inspection Service at the port of New York recently conducted an inquiry regarding the drowning of the engineer of the New York Central tug No. 4, in the collision with the steamer C. W. Morse. Capt. Ira Harris has issued a bulletin stating that both vessels were properly handled and the officers were blameless.

The Enterprise Transportation Co., operating what it claims to be the only independent steamboat line from New York to New England, has recently issued a circular setting out its accomplishments in its two years of existence. The company started with only one steamer and now operates five vessels in two distinct services,

with a combined tonnage of 6,050 tons, and passenger accommodations for 2,350 persons.

The upward march of trade in New York is nowhere better illustrated than on the North river front. A few years ago Fourteenth street marked the last of the piers at which the big trans-Atlantic liners tied up. Now the Chelsea improvements, near Twenty-third street, mark another step up-town. Times Square is becoming the most important center of the city, and this fact is not only shown by the moving north of many large business houses, but by the steamboat lines and the railroads, which in the search for new piers ask: "How near is the site to Times Square and what are the facilities for getting there?"

The recent cry of "dull times," raised by various manufacturing interests of the country, finds no echo in the business of Allis-Chalmers Co., which continues to show a steady gain. During the month of May this company shipped from its works 553 cars of machinery, which was a gain of twenty cars over the record established for April. In April the aggregate weight of shipments was 21,680,847 lbs., while for the month of May the figures had risen to 23,772,242 lbs., making a total weight for the two months of 45,463,089 lbs. Cars bearing this enormous quantity of machinery, if coupled in one train, would have covered a distance of about eight miles.

#### IN THE DISTRICT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF MICHIGAN, NORTHERN DIVISION: IN ADMIRALTY.

In the Matter of the Petition of Frank S. Upton, owner of the steamer John C. Gault, for Limitation of Liability.

The undersigned, Hezekiah M. Gillett, a trustee appointed by this court in the above proceedings under the provisions of the Revised Statutes of the United States respecting limitation of liability, was authorized and empowered by the order of this court made and entered on June 14, 1907, to cause the said Steamer John C. Gault, her engines, boiler, machinery, boats, tackle, apparel and furniture, to be sold as said property now lies, at public auction.

Now, therefore, by virtue of said order, notice is hereby given, that I shall cause to be sold at public auction, to the highest bidder for cash, at the front door of the Post Office Building, so called, on Washington Street in Bay City, Michigan, that being the building in which are held the sessions of the District and Circuit Courts of the United States for the Northern Division of the Eastern District of Michigan, on Saturday, the 6th day of July, 1907, at 2 o'clock in the afternoon of that day, the said Steamer John C. Gault, her engines, boiler, machinery, boats, tackle, apparel and furniture as said property now lies.

Dated, Bay City, Michigan, June 17th, 1907.

HEZEKIAH M. GILLETT, Trustee,

Bay City, Mich.

Shaw, Warren, Cady & Oakes, Detroit, Mich.

Proctors for petitioner.

Gray & Gray, Detroit, Mich.

Proctors for libelants in principal case.

# THE MARINE REVIEW

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No. 26

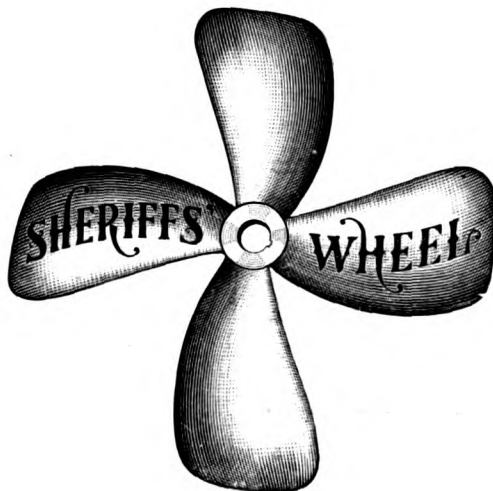


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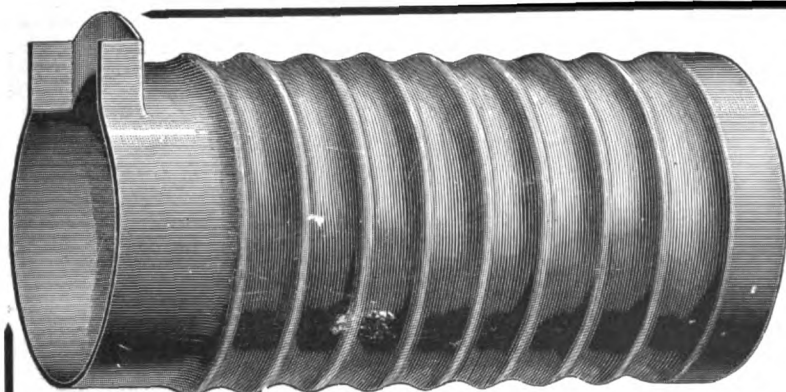
**3,000  
Propeller  
Wheels  
made to  
date.**



**Marine  
Machinery  
—  
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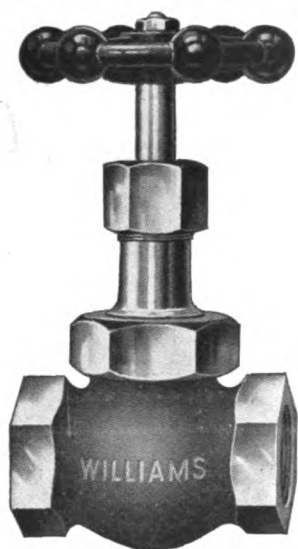
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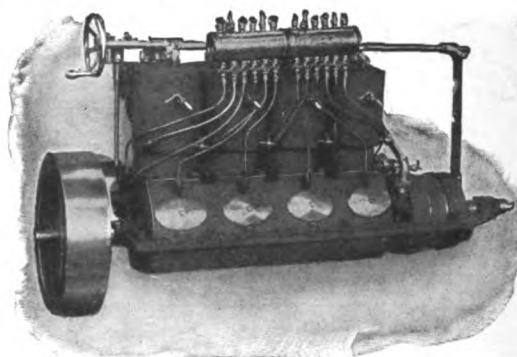


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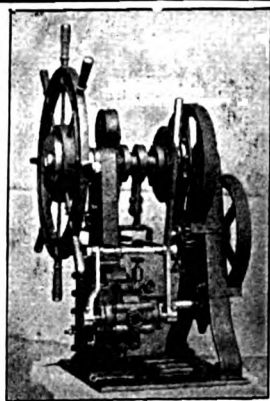
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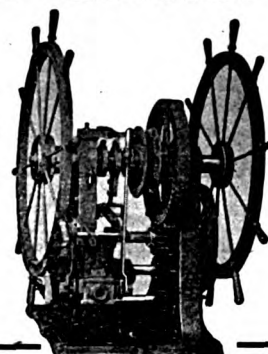


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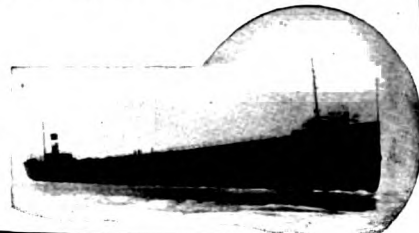
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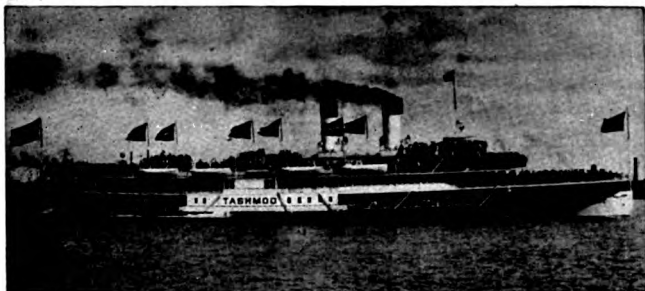
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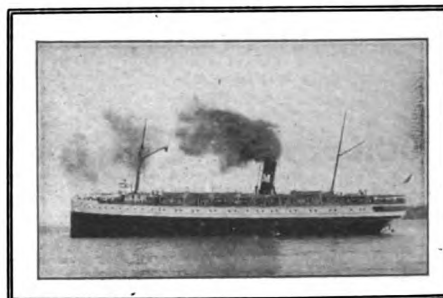
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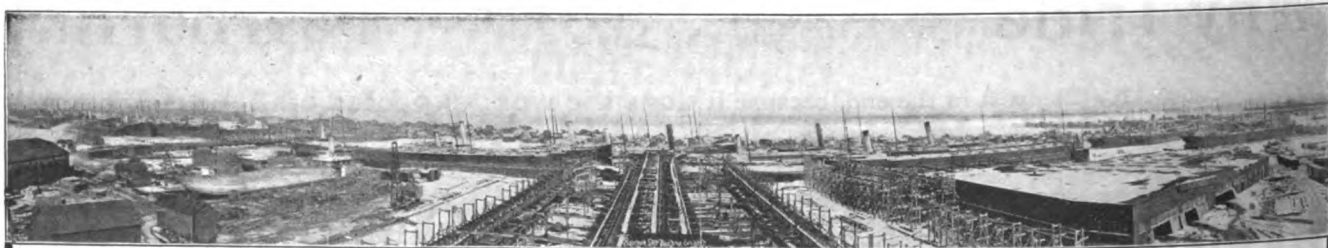


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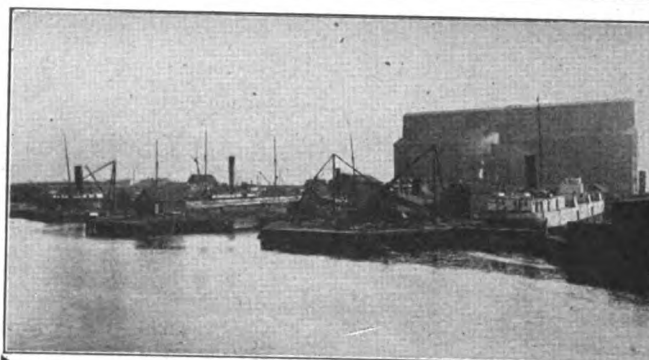
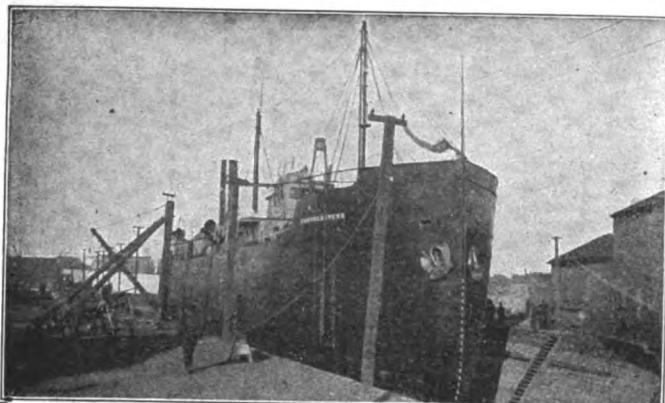
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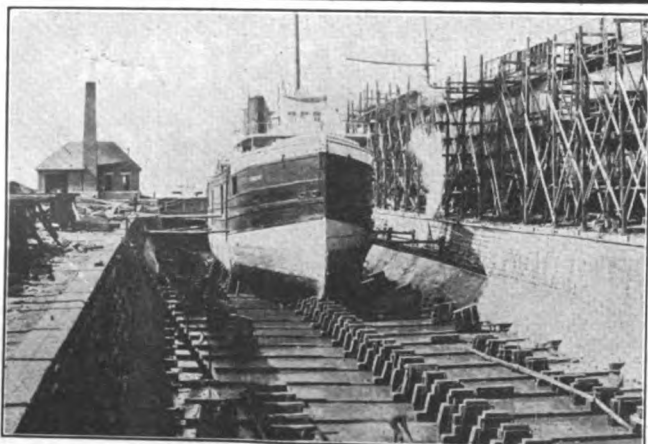
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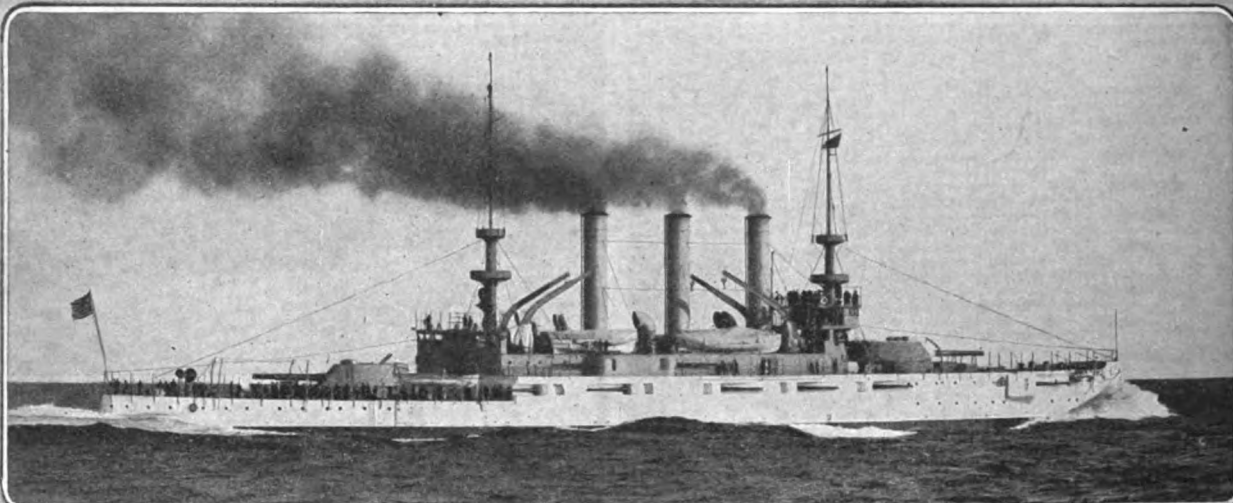
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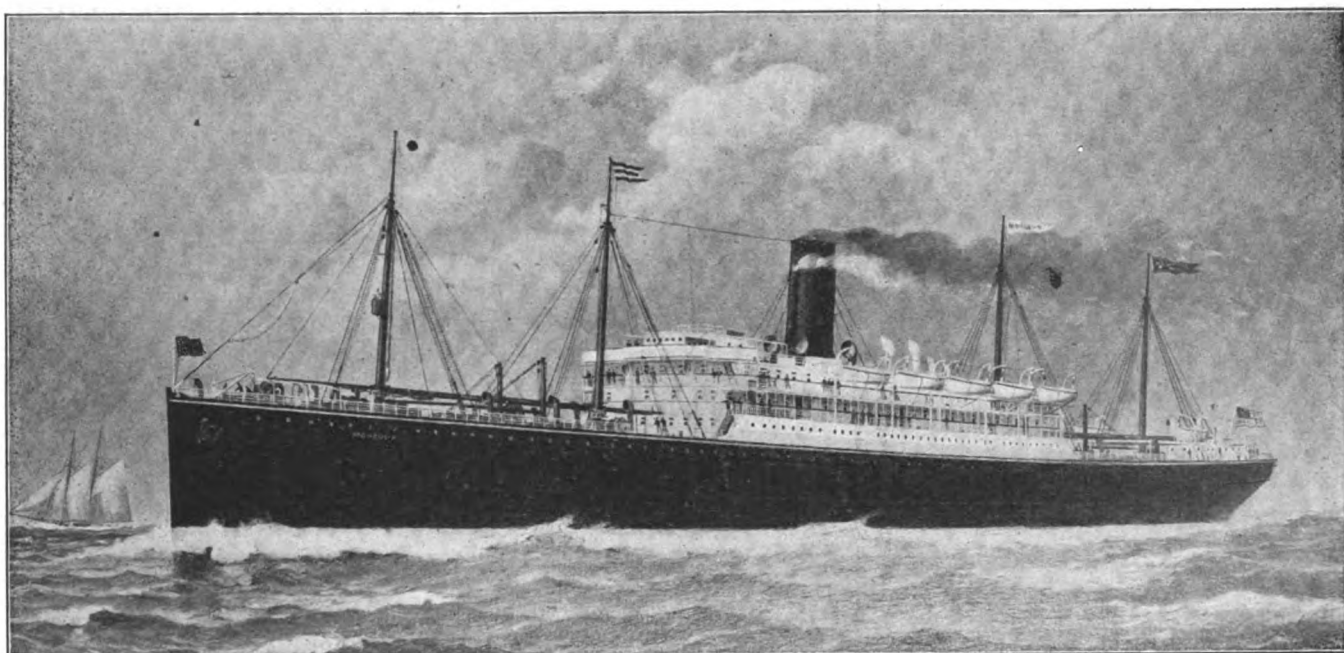
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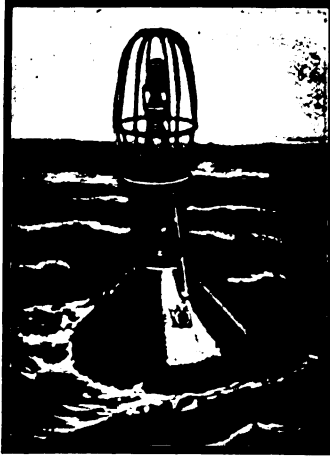


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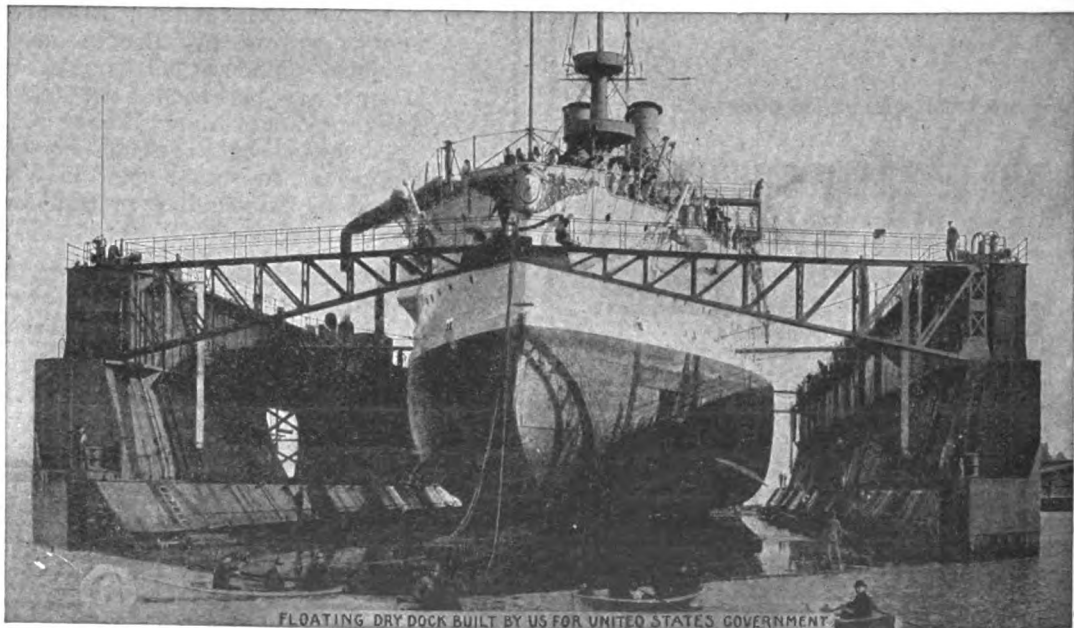
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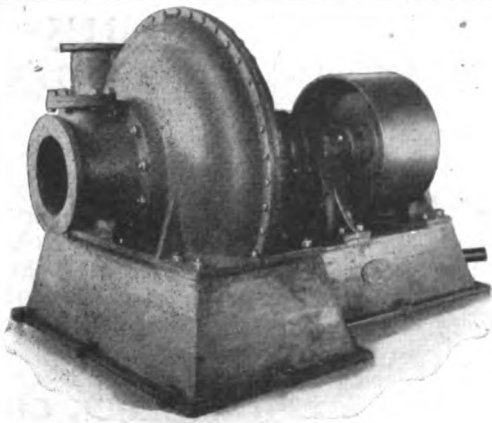
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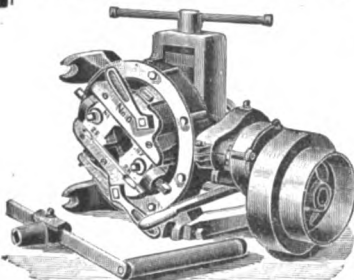
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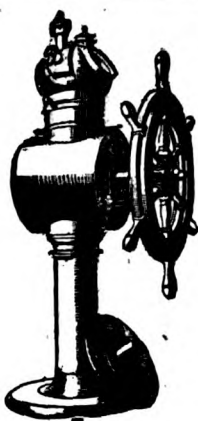
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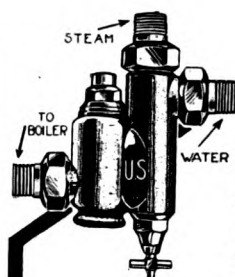
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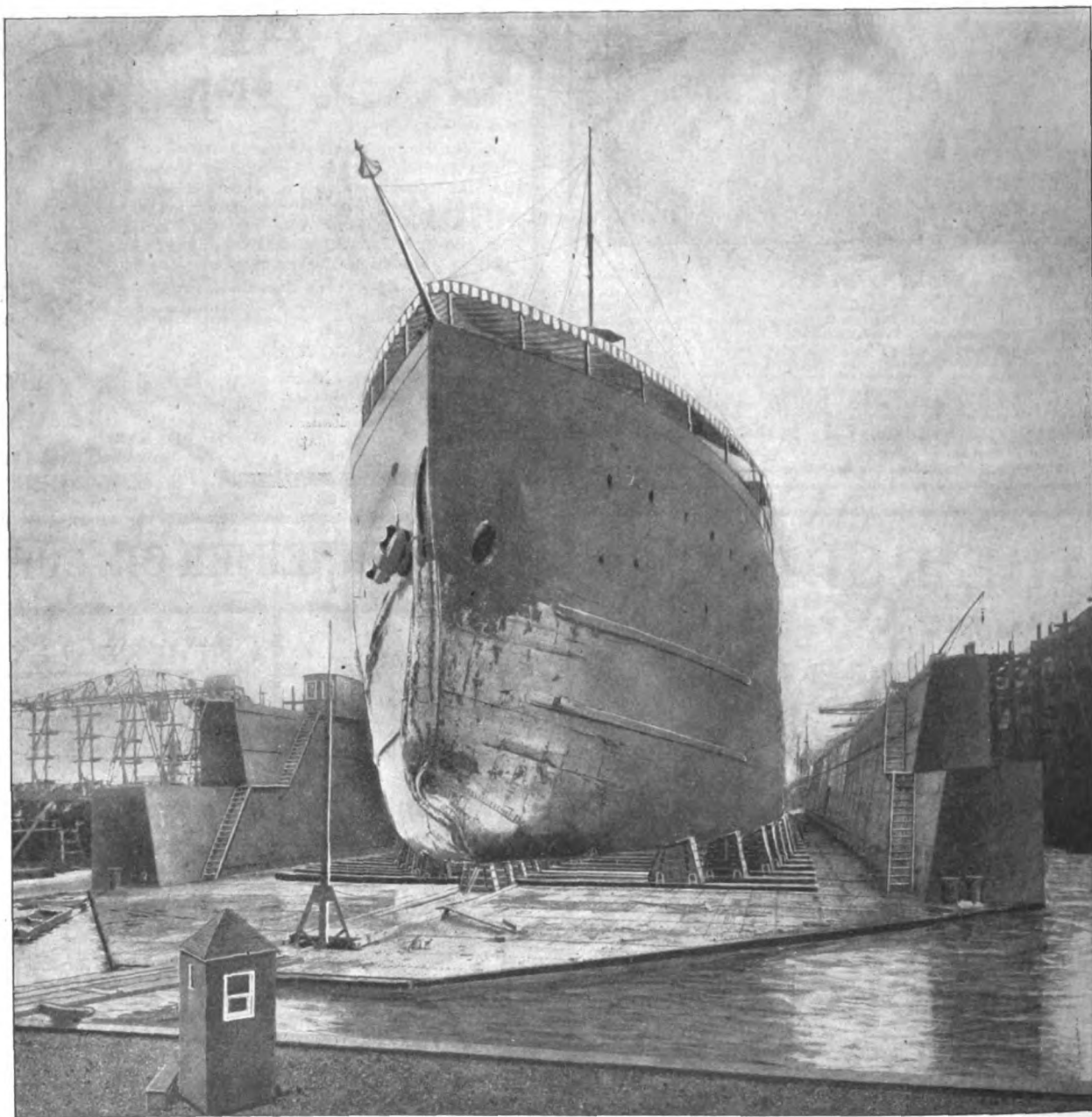
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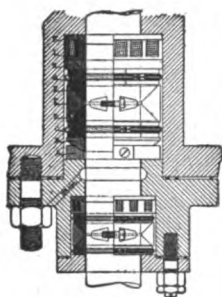
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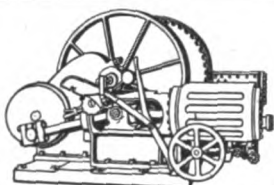
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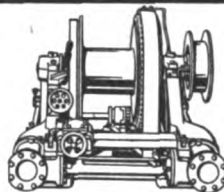
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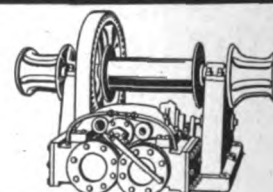
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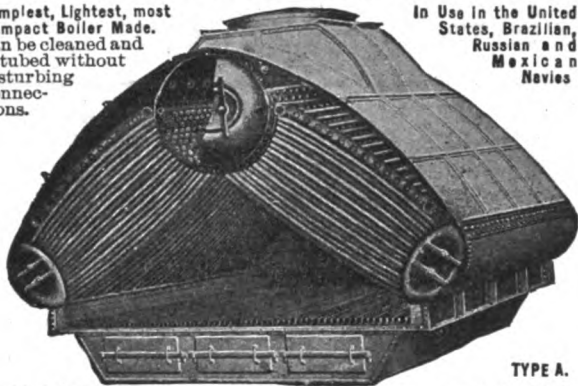
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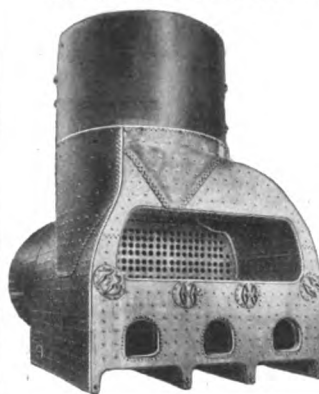
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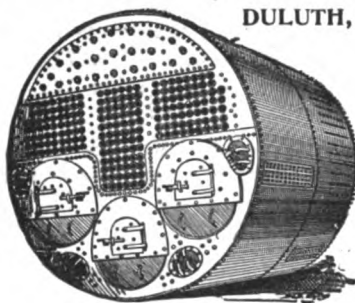
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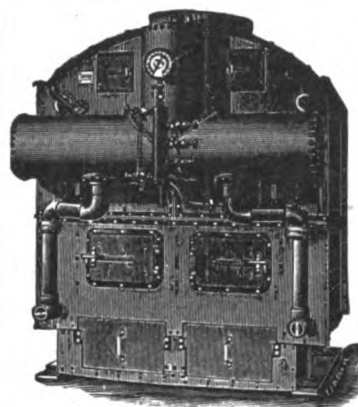
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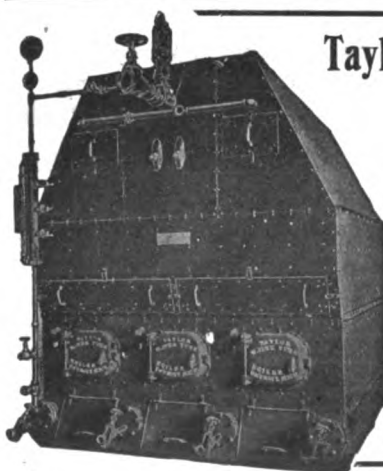
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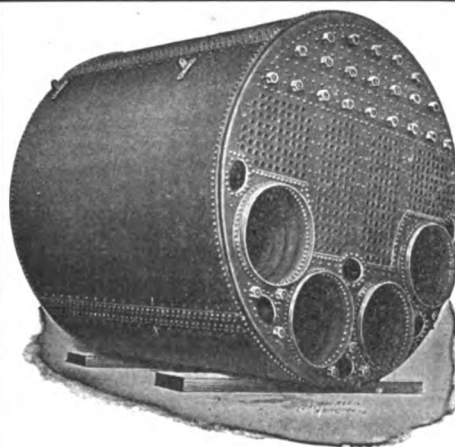
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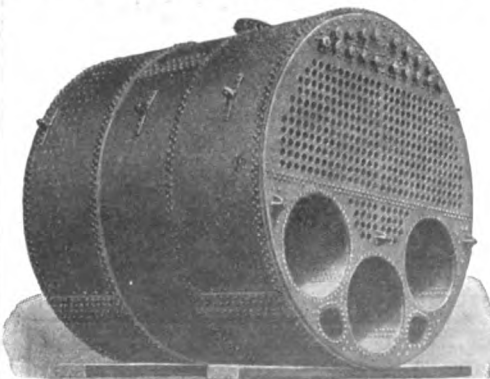
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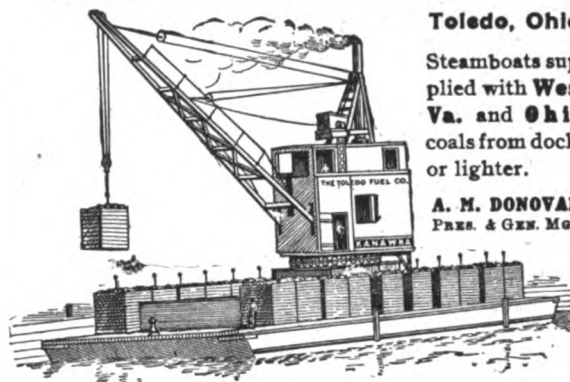
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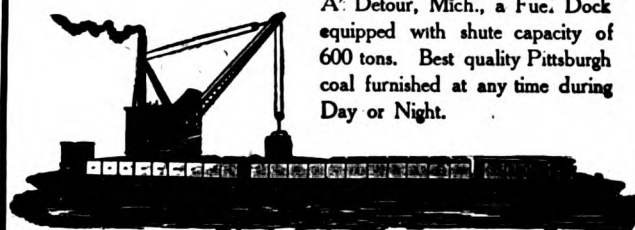
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Milwaukee Dry Dock Co.....  
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Newport News Ship Building Co.....  
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Superior Ship Building Co.....  
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Tietjen & Lang Dry Dock Co.....  
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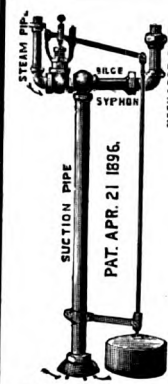
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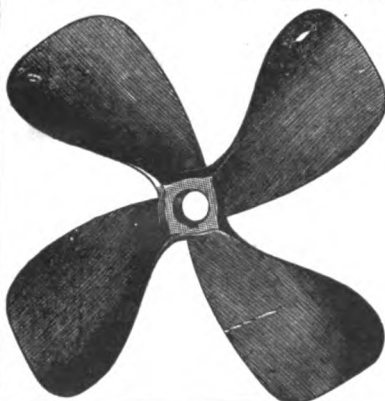
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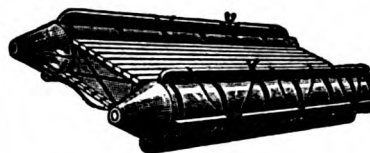
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Great Lakes Engineering Works. ....  
..... Detroit.

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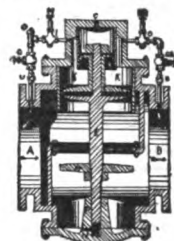
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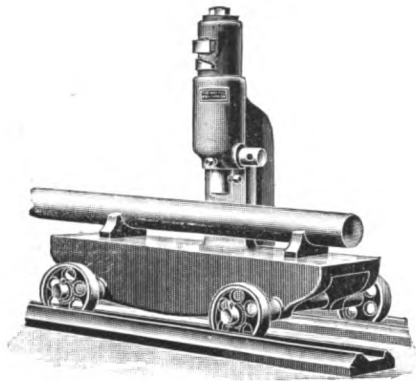
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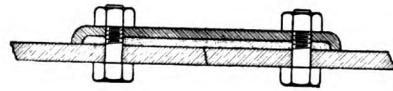
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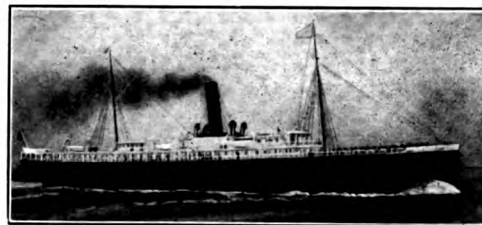
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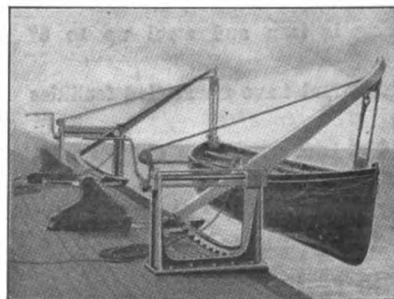


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